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# **Sign-Spatiality in Kata Kolok**

how a village sign language of Bali inscribes its  
signing space

## **Proefschrift**

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aan de Radboud Universiteit Nijmegen  
op gezag van de rector magnificus prof. mr. S.C.J.J. Kortmann,  
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door

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geboren op 22 augustus 1983  
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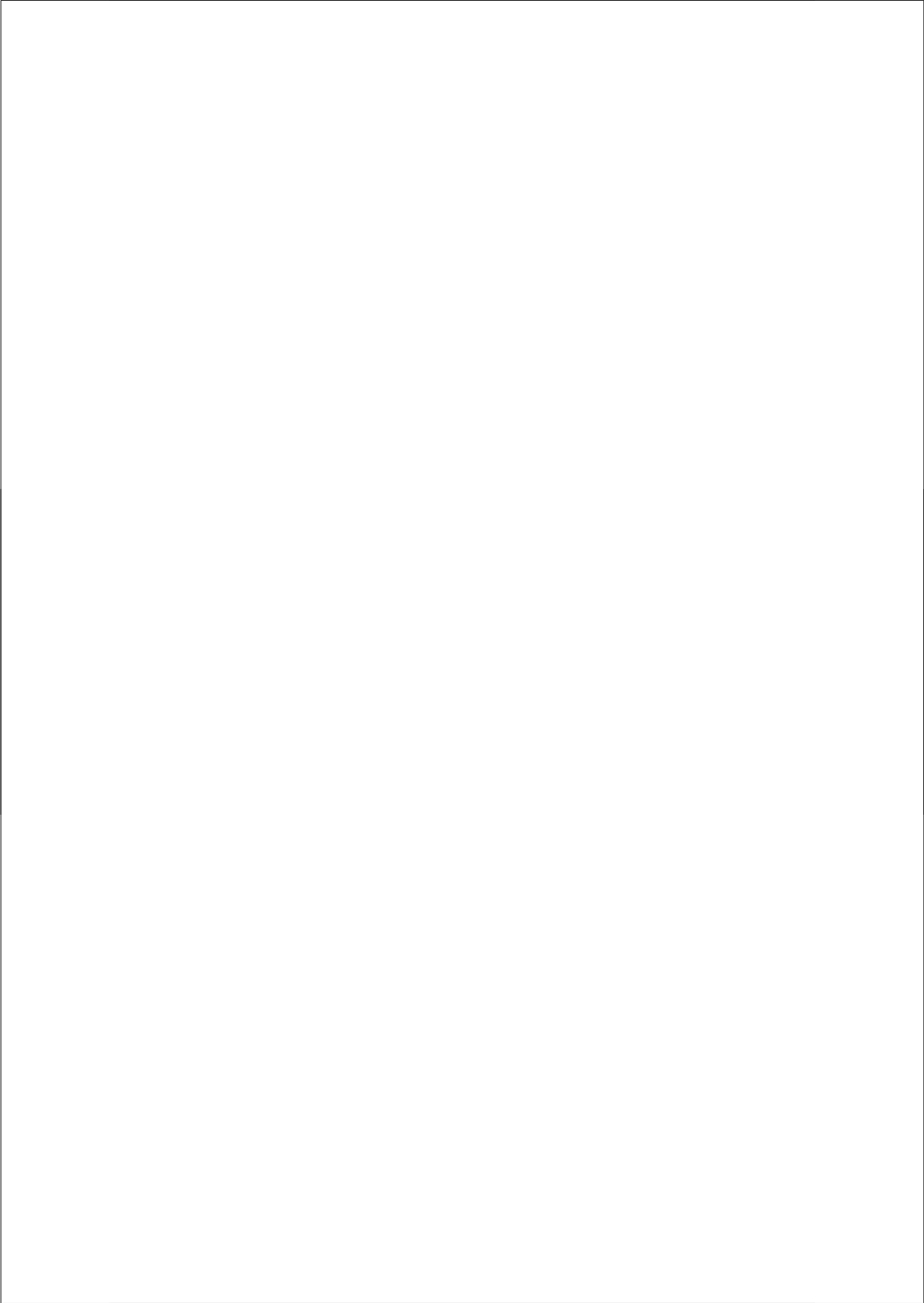
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# ***PART I INTRODUCTION***

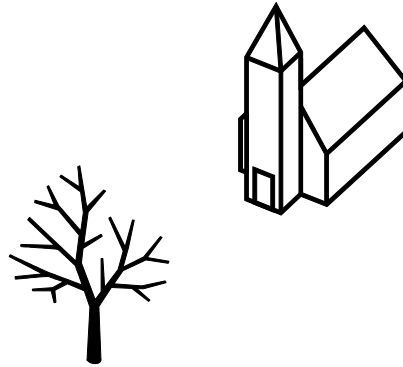
## ***1 When space is special: sign-spatial mapping***

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### *1.1 Conventionalisation of space across cultures and languages*

Our conception of space is crucial to the most fundamental aspects of everyday life. On a physical level we need spatial representations to grasp a cup of tea in the morning, to hug our loved ones, get down the stairs, and find our way in and out of the bicycle shed. On a more abstract level, we use space to ‘grasp’ the world that surrounds us. We use spatial language to express the way that we feel, to describe the low-frequency noise of a passing ship or a high register of speech, or to conceptualise religious notions such as heaven and hell (Lakoff & Johnson 1980). In this context, sign languages are particularly intriguing in that they not only discuss space: they exist in space. This thesis deals with the ways in which sign languages recruit space to talk about both spatial and non-spatial matters. This spatial, semiotic strategy, a recurring theme throughout the thesis, will be referred to as sign-spatial mapping.

Cross-linguistic research has revealed that different human cultural groups talk about everyday spatial configurations in radically different ways (Pederson et al. 1998; Levinson 2003; Levinson & Wilkins 2006). Central to understanding this typological variation is the notion of a Figure-Ground construction. A Figure-Ground construction describes the relation between a backgrounded object (the Ground) and a foregrounded object (the Figure). In Figure 1.1 below, an example is presented of two objects that could be described by a Figure-Ground construction. In English, there are multiple valid ways to describe this array. For instance, one could say “the tree is to the left of the church”, or “the tree is in front of the church”, or perhaps even “the tree is west of the church”.



**Figure 1.1** Figure-Ground array

These three options constitute three linguistic types of description that are called Frames of Reference (Levinson 2003). Many languages have all three Frames of Reference available, yet these Frames are applicable to different configurations. For an English speaker, it would be unusual, for example, to say something like: “There is some *sambal* on your northern cheek,” in order to point out that there is a bit of chilli sauce on your face. The Balinese, however, would have no difficulty interpreting the meaning of the spoken Balinese equivalent, and not just because of their different cuisine, but because the Balinese prefer an absolute Frame of Reference.<sup>1</sup> The Frame of Reference used in descriptions of these kinds of everyday arrays is a proxy for the dominant Frame of Reference for speakers of that language. Psycholinguistic experiments have revealed a correlation between the dominant Frame of Reference of speakers and cognitive behaviour in, for instance, spatial memory tasks (Pederson et al. 1998; Levinson, Kita, Haun, & Rasch 2002; Levinson 2003; Majid, Bowerman, Kita, Haun, & Levinson 2004;

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<sup>1</sup> This example is extrapolated from Mead and Bateson (1942:6): “the words for the cardinal points are among the first that a child learns and are used even for the geography of the body. A Balinese will tell you that there is a fly on the “west” side of your face.”



Haun, Rapold, Janzen, & Levinson 2011). For this reason, the linguistic description of a wide variety of languages is not a question of butterfly-collecting, but contributes to our understanding of the cognitive flexibility and the diversity among humans, and the role language plays in this story.

Spoken Balinese has four cardinal direction terms: *kajah*, *kangin*, *kelod*, and *kauh*, often loosely translated as ‘north,’ ‘east,’ ‘south,’ ‘west’ (Wassmann & Dasen 1998).<sup>2</sup> The Balinese are highly attuned to this geocentric conceptualisation of space, and this is shown in many areas of their culture: town and country planning, architecture, religion, and rearing children. At the building stage, Balinese villages, temples, and houses are oriented according to a fixed spatial format with the entrance *kelod* and the exit *kaja* (Covarrubias 1950:265). The family temple in a house is always built in the *kaja/kangin* corner, as this is the most sacred direction. Conversely, the animals and the rubbish are found in the least sacred corner: *kelod/kauh* (Wassmann & Dasen 1998:693). Children are taught that the appropriate direction to rest their heads is *kauh*, and acquire the cardinal direction terms early on, by four years of age (Mead & Bateson 1942:6; Dasen & Mishra 2010:113). Geocentric space is part of a larger cultural construct associating body parts, gods, colours and numbers with the cardinal directions (Covarrubias 1950:76; Wassmann & Dasen 1998; Dasen & Mishra 201:77-79). Apart from these cultural elaborations, the Balinese also use absolute gestures while they speak (Wassmann & Dasen 2006; Dasen & Mishra 2010).

### 1.2 *Bengkala and Kata Kolok*

This thesis is about a small village community in the north of Bali, and the indigenous sign language that has emerged there. The Balinese refer to Bengkala as *Desa Kolok* - which is Balinese for ‘deaf village’ - and its sign language is

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<sup>2</sup> Section 9.3.3 describes the semantics of these Balinese terms.

referred to as Kata Kolok: ‘deaf talk’. The village has had a high incidence of deafness for long periods of time and the sign language is not only used by its deaf inhabitants but also by the majority of Bengkala’s hearing population. Socio-linguistically, this type of language is referred to as a village sign language (Zeshan 2006b). The language currently functions in all major aspects of village life and has been acquired from birth by multiple generations of deaf, native signers. Kata Kolok is a fully-fledged sign language in every sense of the word. Initial reports of the language have alluded to the presence of an absolute Frame of Reference parallel to spoken Balinese (Zeshan 2006a; Marsaja 2008:162; Perniss & Zeshan 2008; Zeshan, Marsaja, & de Vos in prep.). There are at present several descriptions of spoken languages with a dominant absolute Frame of Reference (Haviland 1998; Levinson 2003; Wilkins 2006), but an ‘absolute’ sign language is yet to be documented.

### *1.3 A brief introduction to sign linguistics*

There has been much misinformation regarding the nature and origins of sign languages. Some of these false assumptions include the idea that there is a single universal sign language, that the syntactic structure of sign languages is dependent on spoken language, and that sign language closely resembles the art of pantomime. Wilhelm Wundt (1830-1920), an early psychologist, was one of those who noted that the structure of sign language is not, in any way, parasitic on spoken language:

“This self-formative sign language can rightly be called a natural system of gestures. It by no means demands a pre-existing medium of communication, such as speech or script, and thus does not require a long, continuous tradition, but can of necessity arise among a group of deaf-mutes, or among deaf-mutes and those able to hear.”

Wundt 1973 [1921]:58

It was not until several decades later, however, that a sign language was analyzed “by the rigorous methodology of structural linguistics” (Stokoe 1960:3).<sup>3</sup> Stokoe not only inspired generations of sign linguists to come, but also introduced the field of sign language linguistics, an appreciation of sign languages as fully-fledged languages by both Deaf people and (some) hearing people.<sup>4</sup> Linguistic evidence has proved vital to the legal recognition of sign languages, improved access to deaf education, and the establishment of sign language interpreting programmes.<sup>5</sup> This impact has been ongoing; the linguistic analysis of a sign language is an important step towards the empowerment of Deaf communities in countries around the world.

Presumably for these political reasons, many of the original studies on sign languages focused on the parallels between spoken and signed languages (Liddell 2002; Woll 2003; Kendon 2008). The linguistic analysis of sign languages has indeed identified parallels in the patterns of language acquisition, processing by the brain, and linguistic structure (for an overview, see the papers in Meier, Cormier, & Quinto-Pozos 2002). Granting these similarities, sign languages are of necessity produced gesturally and perceived visually, while most of the communicative load of spoken languages relies on vocal production and hearing.<sup>6</sup> For this reason we might expect modality - the medium of communication - to have an effect, too. Liddell (2003) phrases this as follows:

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3 A few European studies predate Stokoe’s dissertation, but these reached a smaller audience, presumably because they were not written in English (see for example Tervoort 1953 on Sign Language of the Netherlands).

4 For a discussion of the use of deaf versus Deaf see section 2.2.3.

<sup>5</sup> In fact, none of the signing varieties in Indonesia has been legally recognised at present (Palfreyman p.c.).

<sup>6</sup> However, co-speech gestures - visual cues accompanying speech - have been shown to play a crucial role in hearing interactions (Schegloff 1984; McNeill 2000; Kendon 2004; Enfield 2009).

“One of the key articulatory differences between spoken and signed languages lies in the mobility and visibility of the hands. While vocal articulators such as the glottis, and the velum are limited to largely unseen movements within the vocal tract, the hands are capable of making intricate, visible, spatial distinctions. Sign languages exploit this capability by allowing signs to be directed and placed meaningfully.”

Liddell 2003:66

Sign languages indeed seem to favour the simultaneous use of multiple articulators at various levels of linguistic representation (see the papers in Vermeerbergen, Leeson, & Crasborn 2007). In describing Figure-Ground arrays, for instance, the hands may be placed in the signing space to represent both objects in the scene simultaneously. The gestural modality thus affords sign languages with modality-specific structures in the domain of spatial representation in particular (Emmorey 2002).<sup>7</sup> One of the crucial differences is that signs are essentially spatial entities themselves, whereas words are not. While speakers generally distribute the message over both auditive and visual forms, signed communication is channelled through the various visual articulators (Enfield 2009).

#### *1.4 Cross-linguistic variation in sign-spatial mappings*

This thesis uses the term sign-spatial mapping for the ways in which signers imbue the signing space – the articulatory space that surrounds them – with meaning. The sections below present an overview of the cross-linguistic generalisations and exceptions in three domains in which these sign-spatial mappings are found to be most pervasive: in discussing space, in referring to grammatical person, and in temporal expressions (see also Friedman 1975). As will become clear, further analysis of Kata Kolok is expected to contribute a great deal to our understanding

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<sup>7</sup> Throughout the thesis, I use the term gestural modality to include tactile sign languages, which are produced gesturally, and perceived by touch. Notably, the gestural modality includes signals that are not produced by the hands, for example facial expressions.

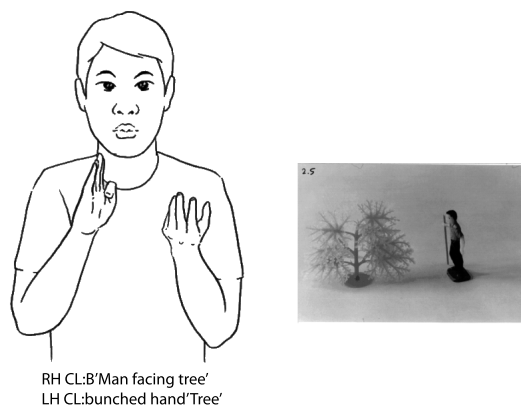
of cross-linguistic variation within these domains. Section 1.4.4 concludes that the dichotomy between the uses of signing space to express spatial and non-spatial functions is crucial to describing the ways in which Kata Kolok diverges from other sign languages in the domain of sign-spatial mapping in particular.

#### 1.4.1 Using the signing space to talk about space

Signers may exploit the spatial nature of the gestural modality in multiple ways, and these expressive means have been described in many sign languages (see for instance Emmorey (2002) on American Sign Languages; Perniss (2007) on German Sign Language). The spatial movement of a sign may represent an actual movement within a narrative, for example when a signer uses the movement of his/her hand to represent a person walking down a street. Now imagine this person walking down the street and bumping into a friend; it is the spatial orientation and respective locations of the hands, as they represent the woman and her friend, which attain a spatial interpretation. Signers may also produce pointing signs, by which means they ascribe a referential meaning to a designated area of the signing space. For example, subsequent to describing the conversation that might have taken place after the woman and her friend had met, a signer could refer back to the couple by pointing at the location where they were represented in the signing space. Furthermore, like spatial expressions of spoken languages, these functions of signing space are not restricted to the domain of spatial description but can be extended to refer to non-spatial domains as well.

One of the major differences between spoken and signed languages in the spatial domain, is that, rather than using labels denoting specific spatial relations such as behind, on top of, or west of, sign languages mainly rely on iconic structures to describe spatial scenes (Emmorey & Falgier 1999; Talmy 2003; Arik 2009). One of the structures in which spatial iconicity plays a central role is in simultaneous classifier constructions. These are bimanual expressions in which each of the hands represents an entity, and the spatial relationship between the

signs represents the actual spatial array. Figure 1.2 displays an example of a simultaneous classifier construction and the spatial stimulus, which it describes. The signer uses his right hand to represent the man in the picture, and his left hand to represent the tree. The spatial relation between these entities becomes clear to the signer's interlocutor by viewing the spatial relation between the classifier hands as they are produced in the signing space. Simultaneous classifier constructions have a high degree of complexity, as at least three spatial objects can be relevant to these utterances (the signer and both of his hands). The position, orientation, and movement of each hand could provide further spatial information, along with the distance of each hand from the other articulators. Simultaneous classifier constructions therefore possibly exhaust the sign-spatial affordances of the gestural modality.<sup>8</sup>



**Figure 1.2** Simultaneous classifier constructions directly map referents onto hands

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<sup>8</sup> Potentially, additional cues, such as shoulder position or mouthings, could play a role in the interpretation of simultaneous classifier constructions, but this has not been reported in the literature.

The cross-linguistic investigation of locative functions of the signing space has revealed striking resemblances among sign languages in the use of simultaneous classifier constructions (Emmorey 2003; Eccarius & Brentari 2007). Moreover, sign language users across a number of sign languages have been shown to perform the same mental rotation in interpreting simultaneous classifier constructions, namely, they rotate the scene as a whole to interpret the signed expression, which thus encodes the viewpoint (Emmorey, Klima, & Hickok 1998; Perniss 2007:157; Arik 2008). However, comparative research has also indicated a few differences between sign languages in their use of simultaneous classifier constructions. A recent study of Turkish Sign Language revealed that one third of the simultaneous classifier constructions, produced on the sagittal axis, entailed no viewpoint information (Arik 2008). Furthermore, signers of the first cohort of Nicaraguan Sign Language do not follow a single convention in interpreting simultaneous classifier constructions from either the sign-producer's or sign-perceiver's viewpoint (Pyers et al. 2010). Nyst and Perniss (2004) show that Adamorobe Sign Language lacks a system of entity classifiers to express location and motion, and deploys general motion verbs instead. Kata Kolok discourse is teeming with classifier constructions, but in contrast to previously described sign languages, these are interpreted in line with cardinal directions rather than an external viewpoint (Zeshan 2006a; section 10.3.1; section 11.2.4). These recent studies suggest that there could be substantial cross-linguistic variation in the spatial structures of individual sign languages. In particular, even though many sign languages deploy simultaneous classifier constructions, the spatial information that is taken to be encoded in them may vary. The spatial representations of sign languages are thus not merely a matter of 'what you see is what you get': the underlying spatial semantics of these sign-spatial mappings might be conventionalised differentially. The results of the present study contribute to this

latter view and to the growing body of research into cross-linguistic variation in the domain of space among sign languages.

#### 1.4.2 Grammatical person and the signing space

The grammars of sign languages are saturated with sign-spatial structures that denote non-spatial relations, too (see Taub (2001) and Liddell (2003) on American Sign Language, Engberg-Pedersen (1993) on Danish Sign Language, and Zeshan (2000) on Indo-Pakistani Sign Language). For instance, movement can be used to describe a transitive event, where one person acts upon another, and locations in signing space can be used to describe the temporal unfolding of a story line. Crucially to the grammatical analysis of space in these sign languages, it has been observed that a grammatically relevant locus is often established, by pointing at locations in the signing space.<sup>9</sup> A locus is “a direction from the signer or a point in the signing space by which a referent is represented” (Engberg-Pedersen 1993:14). The diagram in Figure 1.3 illustrates the idea of a locus as described for many sign languages.<sup>10</sup> The large black figures represent two signers. For referring to first person, the signer points to him/herself, usually by touching the chest. In order to refer to addressees, one points towards the person one is talking to. For third person reference, in other words reference to non-conversational partners, the pointing sign is motivated by the actual location of that person if present at the scene. In the absence of these third person referents, the pointing signs are directed towards the area directly in front of the signer, usually on the left and right sides as

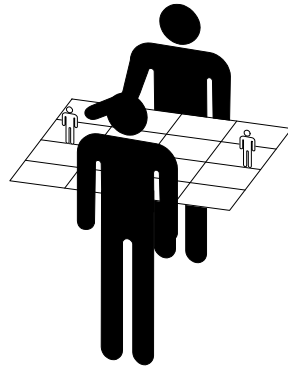
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9 Liddell (2000:366) presents a historical overview of the term ‘locus’ and how it has been used in the literature on sign linguistics. Scott Liddell is also one of the critics of the notion of locus (see section 7.2).

10 Initial studies focussed on pointing in American Sign Language (e.g. Friedman 1975; Kegl 2003 [1976]), but the phenomenon has been described for many sign languages since (Ahlgren 1990; Engberg-Pedersen 1993:117-139 Zeshan 2000:99).

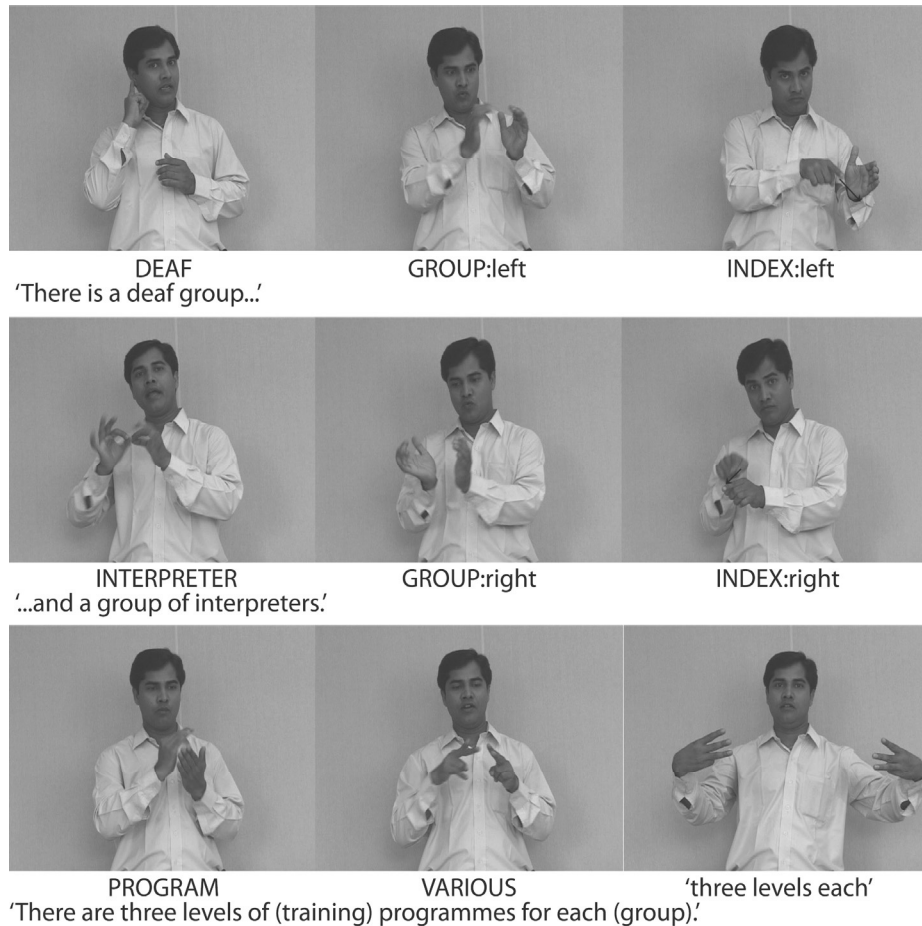


arbitrary points for anaphoric reference. These locations, called ‘loci,’ are represented by the small white figures in Figure 1.3.



**Figure 1.3** Localisation in sign languages

Signers establish loci in order to set up a discourse in which they can refer back to the referents associated with these loci. There are three ways in which signers use loci in signed discourse. Signers can anaphorically point at a locus to refer back to the referent associated with it. Signers may also locate certain nouns or even whole propositions at that locus to associate them with the presupposed referent. Figure 1.4 presents a mini-discourse from Indian Sign Language. In this example, the signer localises two groups (Deaf people and interpreters), one on the right side, and one the left side. This is achieved not only by pointing (here transcribed as INDEX), but also by articulating the sign GROUP to the right and left-hand side respectively, rather than at its more common position in the middle. The example illustrates the relevance of loci within signed discourse (picture from Zeshan, Marsaja, & de Vos in prep.).



**Figure 1.4** Localisation in Indian Sign Language  
(from Zeshan, Marsaja, & de Vos in prep.)

Another function of loci is their grammatical role with respect to agreement verbs. This sign-spatial modification indicates the arguments of transitive verbs, and is described in detail in section 4.8.1. Because the phenomenon is prevalent across many sign languages, many researchers have argued that the strategy is universal

to the structure of sign languages (Meier 1990; Liddell 2003:ix; Taub 2001:225; Aronoff, Meir, & Sandler 2005). Combined with descriptions of other village sign languages, the findings of section 4.8.4 challenge this claim.

In addition to the structures described above, signers of many sign languages also use changes in body position and eye gaze to refer back to referents. Such a redirection towards a locus, using eye gaze and body orientation, forms an important cue in a sign language-specific structure known as role shift (Lillo-Martin 1995).<sup>11</sup> When using role shift, signers change the position of the torso, head, and/or shoulders, as well as their facial expression, to enact and thus refer to the participants within a narrative. This anaphoric mechanism can rely on the left-right, or upward and downward changes in the orientation of the signer's face and body, with each body-orientation and respective location in the signing space being associated with a referent within the narrative (Engberg-Pedersen (1993:107f) on Danish Sign Language; Perniss (2007:194) on German Sign Language).

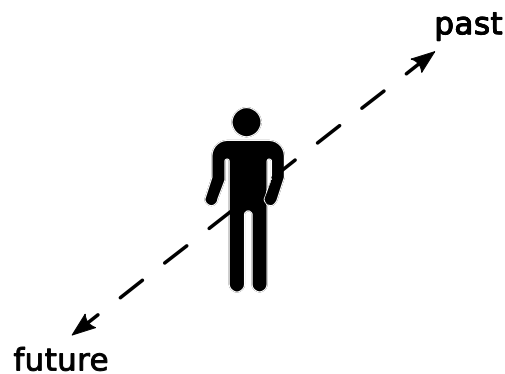
While the sections above have given a brief yet representative overview of the spatial grammars of the majority of documented sign languages, Kata Kolok does not follow these cross-linguistic patterns. Kata Kolok signers do not localise referents by pointing in the empty signing space in front of them (Zeshan 2006a; Zeshan, Marsaja, & de Vos in prep.). Kata Kolok has been reported not to exhibit any evidence of agreement verbs (Zeshan 2006a). In other words, the language does not systematically use spatially-inflected transitive verbs to mark core arguments (Zeshan 2006a; Zeshan, Marsaja, & de Vos in prep.). The question of how the language achieves these anaphoric functions is addressed in Part III, in particular.

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11 This phenomenon is also referred to as constructed action (Metzger 1995), quoted action (Quinto-Pozos 2007), role play (Loew, Kegl, & Poizner 1997), shifted attribution of expressive elements (Engberg-Pedersen 1993:103), and referential shift (Sandler & Lillo-Martin 2006:379).

#### 1.4.3 Time and the signing space

Signing space can be given temporary meanings, which change from one conversation to the next, as in the case of most utterances involving pointing signs. In addition, sign languages attribute to the signing space more permanent meanings, for instance in the use of a timeline that runs from the front to the back, representing the future and the past consistently.<sup>12</sup> A typical timeline runs along a signer's sagittal axis, and is split at the signer's centre, such that the area behind the signer represents the past, and the front of the signer represents the future. This type of timeline is illustrated by Figure 1.5.



**Figure 1.5** Typologically prevalent body-anchored timeline

Timelines are used on both the discourse and lexical level. When a timeline is used to structure discourse, the relative position of signs as mapped onto the spatial axis reflects the temporal relationship between events. Lexical signs may also adhere to the sagittal, body-anchored timeline. In American Sign Language, for instance, the

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<sup>12</sup> For examples from American Sign Language see Friedman (1975), Cogen (1977), and Emmorey (1996); for British Sign Language see Brennan (1983) and Sutton-Spence & Woll (1999); for Danish Sign Language see Engberg-Pedersen (1993:80ff); for Indo-Pakistani Sign Language see Zeshan (2000:122); and, for Sign Language of the Netherlands see Schermer & Koolhof (1990).

sign POSTPONE has a forward movement to indicate that an event or activity is ‘moved’ towards the future (Emmorey 1996). Conversely, the sign HISTORY moves from the shoulder backward. The body-anchored timeline also systematically underlies the oppositions between NEXT-WEEK and LAST-WEEK or NEXT-YEAR and LAST-YEAR in American Sign Language and in many other sign languages. In these signs, the sign-spatial movement along the imagined timeline disambiguates between references to the future and the past.

Crucially, the front-back timeline that has just been described is the typologically prevalent structure, but it is not the only option, and time can be projected onto space in a number of different ways. The lateral and diagonal axes may also be used for specific discourse functions (see Engberg-Pedersen (1993:80-89) for a detailed description of timelines in Danish Sign Language). Interestingly, the sign-spatial mapping in these lateral and diagonal timelines reflects the relative order of events, rather than past or future reference with respect to the coding time. In the case of Urúbu-Kaapor Sign Language, the future timeline is projected upward from the top of the head as it is beyond the control of man; and the past does not continue behind the body, rather, the timeline ends at signer’s shoulders (Brito 1983). It thus appears that the future is not associated with the signing space behind the signer, but rather the area above the signer’s head within this sign language.<sup>13</sup> In the co-speech gestures of the Aymara (Nuñez & Sweetser 2006), a sagittal timeline exists where the space behind the speaker represents the future, and the space in front represents the past. In contrast to other sign languages, Kata Kolok does not deploy any body-anchored timelines (Zeshan 2006b; Zeshan, Marsaja, & de Vos in prep.; section 8.3). There is some evidence of a celestial

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13 According to Engberg-Pedersen (1993:80), Urúbu-Kaapor Sign Language signers do not utilise a timeline, and Kyle and Woll (1985:144) claim that signers of Urúbu-Kaapor Sign Language project future events to their backs, but I have not been able to verify either of these references.

timeline, which runs from east to west (Marsaja 2008:166), but the use of this timeline is limited to the indication of times during day and night, and with few exceptions, temporal adverbs in Kata Kolok are ambiguous with respect to time (see chapter 8 for how this ambiguity is resolved in Kata Kolok discourse).

#### 1.4.4 Spatial and non-spatial functions of sign-spatial mapping

When the signing space is used to express spatial notions, this is referred to as topographic space (Klima & Bellugi 1979; Poizner, Klima, & Bellugi 1987). The overview above has shown that, like spatial expressions in spoken languages, the functions of the signing space are not restricted to the domain of spatial description. Signers deploy the signing space to talk about non-spatial (e.g. temporal or grammatical) relations, too. The literature on sign languages and co-speech gesture generally adopts the term metaphoric space to refer to this latter function of the signing space (McNeill 1992; Taub 2001). While the dichotomy between spatial and non-spatial meanings of sign-spatial mappings is evident, this terminology is unfortunate for two reasons. First, ‘topographic’ normally has a narrow meaning referring to cartography, while the spatial functions of signing space include the description of all kinds of spatial relations: motion events, Figure-Ground constructions, and topological relations, etc. Second, the process through which the signing space is ascribed with meanings may not be ‘metaphorical’ in nature (cf. Taub 2001). For example, signers can create a locus in signing space that temporarily indicates an individual, and it is not evident which conceptual metaphor underlies such specific co-referential strategies.

In any case, previous studies have revealed a large amount of uniformity across sign languages in the use of sign-spatial mapping in both the spatial and non-spatial domain (see for example Taub 2001; Woll 2003). However, the recent developments laid out above also indicate that assumptions of uniformity can be questioned. Adamorobe Sign Language has no entity classifiers, for instance, and Al-Sayyed Bedouin Sign Language and Kata Kolok do not use spatial verb

agreement (Aronoff et al. 2004; Nyst 2007a:158, 196; Zeshan, Marsaja, & de Vos in prep.). It thus appears that Kata Kolok differs from previously described sign languages in its use of sign-spatial mapping with respect to both spatial and non-spatial functions (Zeshan 2006a). An analysis of Kata Kolok data therefore contributes to our understanding of this cross-linguistic variation in sign languages in this domain, and this thesis addresses each core domain in which sign-spatial mappings are used within the language.

### *1.5 Scope and structure of the thesis*

Part II begins by summarising what is currently known about Kata Kolok from genetic, anthropological, and sociolinguistic studies that began in the mid-1990s. These initial descriptions form the basis for the methodological choices that led to the creation of a Kata Kolok corpus, which currently consists of almost 100 hours of video data. This is followed by a grammatical sketch of the structural aspects of Kata Kolok that are prerequisites for understanding the discussion and arguments contained in later parts of the thesis. Along the way, some of the features that are of particular interest in terms of language contact, linguistic typology, and sign language typology are highlighted.

From its inception, the field of sign linguistics has been pre-occupied with the linguistic significance of sign-spatial mapping, and this thesis builds on this long-standing tradition (see for example Supalla 1978; Poizner, Klima, & Bellugi 1987; Engberg-Pedersen 1993; Emmorey & Reilly 1995; Taub 2001; Liddell 2003; Perniss 2007). Part III begins with presenting a brief overview of the ways in which sign-spatial mappings have been framed as well as the linguistic evidence that has been offered in support of these analyses. Sign-spatial structures form a diverse set of phenomena, which can and should be analysed at different levels of structural organisation. Chapter 5 therefore introduces the narrower concept of ‘sign-spatiality’: systematically recruiting the degrees of spatial freedom of signs, by locating, orientating, and directing them to indicate meanings that arise through

the interplay between discourse and grammar. The use of sign-spatiality in Kata Kolok is largely limited to the domain of space. This observation motivates the description of the alternative structures that are used in Kata Kolok deixis in the domains of space, person, and time. In each of these domains, it appears that Kata Kolok sign-spatial structures are primarily resolved exophorically.

Part IV addresses the nature of sign-spatiality as it relates to spatial Frames of Reference described by Levinson (2003). It raises the issue of sign-spatial significance: due to the fact that signs themselves are essentially spatial, and sign-spatiality is exclusively used as a semiotic strategy in Kata Kolok Figure-Ground constructions, an interpretation in any of the three Frames of Reference is available at any time. This part of the thesis is centred on the analysis of spontaneous narratives, and with structured elicitation sets known as the Nijmegen Space Games. The results corroborate previous observations that Kata Kolok signers predominantly commit to an absolute Frame of Reference. The analysis also shows that Kata Kolok signers adopt variable strategies in solving spatial-cognition tasks. This finding is taken to indicate that the choice for a particular Frame of Reference in such cases is influenced by additional eco-cultural factors.

Part V examines pointing signs, which have been traditionally analysed according to their sign-spatial reference to locations and associated entities. Corpus analysis shows that one in six manual signs is a pointing sign in Kata Kolok, and that pointing signs serve a wide variety of functions, including reference to locations, individuals, colours, body parts, and times of day. Across these functions it is found that the sign-spatial properties of pointing signs are rarely the sole determining factor in their interpretation. Instead, based on the examination of over one thousand pointing signs, I argue that context, the construction in which a pointing sign occurs, and the formal properties of the pointing sign itself, as well as simultaneous non-manual marking on the face, cue the meaning of a pointing sign. The interpretation of pointing signs in Kata Kolok thus takes into account multiple



composite signals. Part V concludes with a discussion of how pointing signs and pointing gestures could be compared on equal grounds, in order to come to a deeper understanding of the gestural modality as it functions in these two semiotic ecologies.

The final part of the thesis addresses methodological implications and theoretical considerations that emerge from this thesis. While I hope to provide the reader some insights into the sign-spatial phenomena in the language, the data collection and analysis have not systematically targeted the factors that may have led to Kata Kolok's unusual sign-spatial fingerprint. Such factors could include the impact of Balinese co-speech gesture, L2 learner effects caused by the larger group of semi-fluent signers (section 2.4), and possible inter-generational differences as resulting from the language's relatively limited time depth (section 2.5). Although these aspects of Kata Kolok fall beyond the scope of this thesis, I touch upon them by comparing the findings from Kata Kolok to the literature on Balinese gesture, as well as other (village) sign languages and spoken languages in sections pertaining to these issues in the final thesis part in particular. These cross-linguistic comparisons aim to enable the reader to situate the findings from Kata Kolok in the context of sign language typology. I argue that, on a par with spoken language typology, the analysis of sign languages needs to take into account cross-linguistic variation in the domain of spatial language as expressed by sign-spatial constructions. These descriptions could ultimately serve a cross-modal typology - the empirically grounded investigation of intramodal and intermodal differences between both natural language modalities - in the domain of space, in particular.

## ***PART II PRELIMINARIES***

In these preliminary chapters I provide a background sketch of the village community that uses Kata Kolok supplemented by a description of how the social dynamics within Bengkala have informed the creation of the Kata Kolok corpus. This is followed by an overview of the grammatical structures that are crucial to understanding subsequent thesis parts. Along the way, I highlight the features that are most notable from the perspective of deaf studies and sign linguistics.

## ***2 Bengkala and Kata Kolok: a deaf village and its sign language***

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### ***2.1 Overview***

Bengkala can be classified as a deaf village, that is to say, a community in which deaf and hearing villagers readily use sign language to communicate (Zeshan 2006b). The Balinese refer to Bengkala as *Desa Kolok* - which is Balinese for 'deaf village' – and its sign language as *Kata Kolok*: 'deaf talk'. Section 2.2 focuses on the social dynamics within Bengkala and draws largely on previous work by Branson, Miller, and Marsaja (1999) and Marsaja (2008). Section 2.3 identifies the size and constitution of the *Kata Kolok* signing community. The characteristics of the *Kata Kolok* community challenge views on the dynamics of signing communities that are commonly held by the academic community. The social dynamics between deaf and hearing villagers give rise to particular patterns of language acquisition (section 2.4). The question of how long Bengkala has been a deaf village is addressed in Section 2.5. Section 2.6 lays out the reasons as to why *Kata Kolok*'s unique sociolinguistic setting makes this village sign language vulnerable to extinction at any given moment in time. Section 2.7 lists previous linguistic descriptions of the languages. In this thesis, I argue that the exceptional social dynamics and unique linguistic features laid out in chapter 2 call for different approaches to research compared to other sign languages, especially in relation to the creation of the *Kata Kolok* corpus. These arguments are presented in more detail in chapter 3.

### ***2.2 Bengkala: a deaf village in the north of Bali***

Bengkala is not marked on most maps, and even in the nearest city, Singaraja, few people know of the village or the extraordinary situation that exists there. In Bengkala, 2.2% of the villagers are congenitally deaf (Winata et al. 1995). This

level of incidence is extremely high when compared with, for example, the United States, where less than 0.1% of children are born with a severe hearing impairment (Morton 1991). What is even more striking is that a sign language has emerged here that is used by both deaf and hearing members of the community. Deaf villagers use signs to communicate with their hearing relatives, as well as many of their hearing friends and colleagues, and at least 57% of Bengkulu's hearing population can understand and use Kata Kolok with varying degrees of proficiency (Marsaja 2008:96-100). Although Bengkulu is exceptional, it is not unique. Table 2.1 on p. 24 presents an overview of other deaf villages and their associated village sign languages, alongside a selection of references.

The notion of a deaf village is closely related to the concepts of a "shared-signing community" (Kisch 2008), an "assimilative Deaf community" (Groce 1985; Branson et al. 1999), and a "speech/sign community" (Nonaka 2007). Alternative terms in the literature for village sign languages are "indigenous sign language" (Woodward 2003; Nonaka 2009) and "rural sign language" (de Vos 2011). Moreover, a term sometimes related to village sign languages, but nonetheless distinct, is "emerging sign language," used to indicate a broader category of sign languages that have emerged within the last two or three generations (Padden 2010). In this thesis, the terms deaf village and village sign language have been adopted from Zeshan (2006b).

Village sign languages vary in detail with respect to various social factors such as the causes and incidence of deafness, community size, the ratio of deaf and hearing signers, time depth, etc. (Kusters 2010). Moreover, the linguistic and anthropological documentation and description of deaf villages are still in their initial stages (Nonaka, Nyst, & Kisch 2010). The community that uses Kata Kolok is one of a few examples where analyses have been undertaken covering genetic (Friedman et al. 1995; Morell et al. 1995; Winata et al. 1995; Probst et al. 1998; Wang et al. 1998; Friedman et al. 2000), anthropological (Hinnant 2000),

sociolinguistic (Branson et al. 1999; Marsaja 2008), and in-depth linguistic analyses (Marsaja 2008; Perniss & Zeshan 2008; Schwager & Zeshan 2008; de Vos 2011; Zeshan, Marsaja, & de Vos in prep.). The study of Kata Kolok therefore offers an especially well-documented perspective on the exceptional dynamics that exist in deaf villages and their village sign languages.

LANGUAGE	REGION	REFERENCES
Adamorobe Sign Language	Adamorobe, Ghana	David et al. 1971; Nyst 2007a, 2007b; Nyst & Baker, 2003; Nyst & Perniss, 2004
Algerian Jewish Sign Language	Israel (originated in Algeria)	Lanesman & Meir 2010
Alipur Village Sign Language	Alipur, India	Panda 2009, 2010
Al-Sayyed Bedouin Sign Language	Israel	Aronoff et al. 2004, 2005, 2008; Kisch 2004, 2007, 2008, forthcoming; Sandler et al. 2005, forthcoming, forthcoming; Padden et al. forthcoming
Ban Khor Sign Language	Ban Khor, Thailand	Woodward 2003; Nonaka 2004, 2007, 2009, 2010
Country Sign	Top Hill, St. Elizabeth, Jamaica	Dolman 1986; Cumberbatch 2006
Enga Sign Language	Papua New Guinea	Kendon 1980a, 1980b, 1980c
Grand Caymanian Sign Language	Grand Cayman Island (Caribbean)	Washabaugh 1981
Inuit Sign Language	Canada	Macdougall 2001; Schuit 2009, 2010; Schuit et al. 2011
Kajana Sign Language	Surinam	van den Bogaerde 2006
Kata Kolok	Bengkala, Bali, Indonesia	Friedman et al., 1995; Morell et al., 1995; Winata et al. 1995; Wang et al. 1998; Probst et al. 1998; Branson et al. 1999; Friedman et al. 2000; Hinnant, 2000; Branson & Miller 2004; Marsaja 2008; Perniss & Zeshan, 2008; de Vos 2011
Mardin Sign Language	Turkey	Dikyuva 2008
Martha's Vineyard Sign Language	USA (extinct)	Groce 1985
Providence Island Sign Language	Providence Island	Washabaugh 1979, 1980; Washabaugh et al. 1978; Woodward 1978
Urubú Kaapor Sign Language	Brazil	Kakumasu 1968; Brito 1983
Yucatec Mayan Sign Language	Yucatec Peninsula, Mexico	Shuman 1980; Shuman & Cherry-Shuman 1981; Johnson 1991, 1994; Tree 2009

**Table 2.1** Village sign languages around the world

### 2.2.1 Village life in Bengkala

Bengkala is located in the north of Bali in the region of Kubutambahan. According to recent counts, the village population is 2,740 (Astika 2008), and most of the villagers earn a living by dry-land farming (Marsaja 2008:50f). The village spans 496 hectares in total, but the central village measures only 0.7 by 1 kilometre (Astika 2008). Crops are grown in and around the central village, including turmeric, ginger, peanuts, corn, cassava, bitter cucumber and cashew nuts. In addition, seasonal fruits such as *rambutan*, guava, mangoes, bananas, and oranges are cultivated. Local businesses include food stalls, construction work, carpentry, transport, and tailoring. Most of the deaf villagers earn a living by farming other people's land, and make less than 10,000 Indonesian rupiah a day. As such, they live in poverty, even by Indonesian standards. The main religion of Bali is Hinduism; all inhabitants of Bengkala are Hindu. They all belong to the fourth *sudra* caste, as does 93% of the Balinese population (Covarrubias 1950:53; Astika 2008). Hindu ceremonies play an important role in the lives of the villagers, as they form an occasion to socialise with clan members, prepare and eat special food, and have time away from more onerous duties.

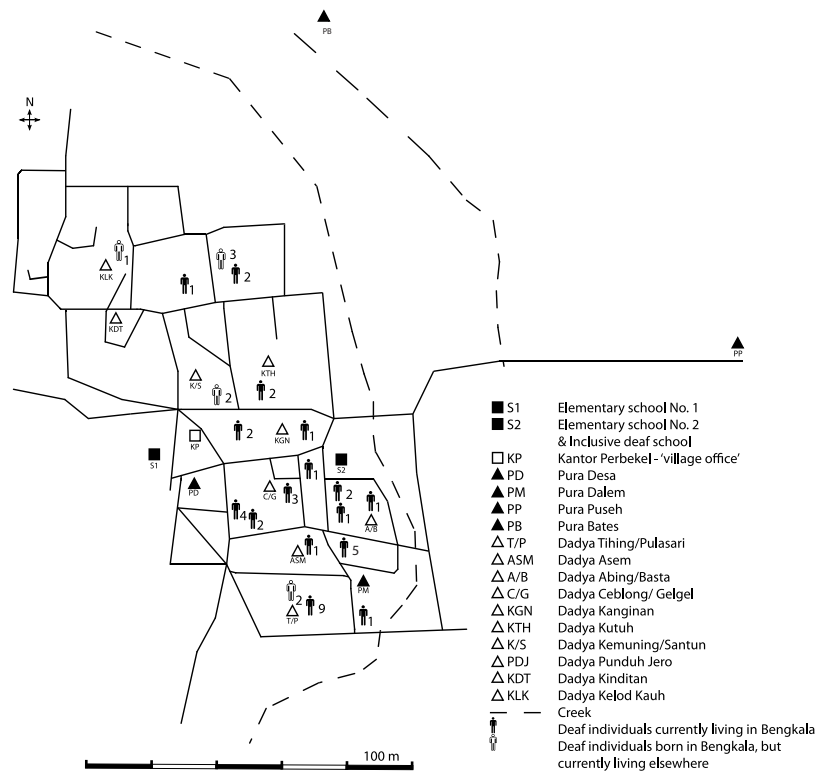
Bengkala can be classified as a non-literate society, as most villagers do not engage in regular literacy activities (Marsaja 2008:52). Four deaf men in Bengkala have received formal education for about three months of their lives. These individuals were invited to the deaf school in the south of Bali as teenagers, but found it hard to settle in at the boarding school. They were also unable to understand the sign language that was used at the school. In recent years, three girls have attended this deaf school in the south of Bali. Another seven deaf children attend classes at one of the village's primary schools at which a local deaf education programme was initiated in 2007. The establishment of this educational program, which uses Kata Kolok as the language of instruction, is discussed further in section 3.2.2.

### 2.2.2 The Kata Kolok signing community

Bengkala is the home of Kata Kolok, and according to a survey conducted in 2000, the sign language is used by more than half of the villagers (Marsaja 2008:99). Assuming that the portion of signers has remained constant since 2000, this means that there are currently at least 1,500 Kata Kolok signers, of whom most are hearing. The comparatively high incidence of deafness and its distribution across the *dadya* ‘village clans’ lead to regular social interaction between deaf and hearing individuals within the community, especially because of ceremonial responsibilities that are shared among clan members (Marsaja 2008:62). Figure 2.1 presents a map of the current geographical distribution of deaf individuals within Bengkala.<sup>14</sup> Due to natural causes, the present number of deaf individuals belonging to Bengkala’s clans is 46. Notably however, eight deaf individuals have migrated to other parts of Bali, Indonesia, and even Australia for educational, socio-economic, and marital reasons. They revisit the village regularly in order to honour cultural and religious obligations, and thus remain an active part of the community. It therefore appears that the Kata Kolok signing community may now have more contact with foreign sign language varieties than was the case twelve years ago (cf. Marsaja 2008:45). There has been limited linguistic influence from this increased contact (but see section 4.2.1), although there have been a number of marriages between deaf individuals from Bengkala and deaf individuals elsewhere. The potential consequences of these recent changes in marital patterns are discussed in section 2.6.

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<sup>14</sup> This map was created in September 2011 during fieldwork supported by the Endangered Languages Documentation Programme under the grant Longitudinal Documentation of Sign Language Acquisition in a Deaf Village in Bali (SG0140).



**Figure 2.1** The geographical distribution of deaf individuals in Bengkala in 2011

Marsaja (2008:79ff) describes the complex multilingual situation of Bengkala in detail. Kata Kolok is the default language when one of the communication partners is deaf. Hearing signers also use Kata Kolok when they need to communicate over large distances – e.g. across the river – or when working in the fields using noisy farming equipment. Importantly, Kata Kolok is used in all aspects of village life by



both deaf and hearing villagers. It is, for example, used in water pipe maintenance – which is vital to the village’s farming activities – and by the village nurse when she tends to deaf villagers. A special register is used in child-directed signing between infants and their caregivers where either the infant or the caregiver (or both) are deaf. Kata Kolok has recently started to be used in formal education for deaf children. The sign language even surfaces on the rare occasions when a *pandetta*, a Hindu priest, is possessed by a deaf god during a trance. It is important to realise that most Kata Kolok signers are hearing villagers who alternate between Kata Kolok, Balinese and Bahasa Indonesia in each of these contexts of language use. The data corpus created as part of the present project aimed to capture both a variety of situations and the variety of signers that constitute this signing community.

### 2.2.3 The social construction of deafness in Bengkala

In sign linguistics and deaf studies it has become customary to refer to deaf signers as 'Deaf' with a capital 'D' (Lane 1984; Reagan 1995; Ladd 2003). The distinction between 'deaf' and 'Deaf' is used to distinguish hearing-impaired individuals in general from sign language users, who associate themselves strongly with a socially and culturally Deaf identity. A Deaf identity is related to the shared experiences common to the lives of many other Deaf people. This set of experiences often includes the attendance of schools with other deaf children, and, in the case of boarding schools, being separated from biological family members for extensive periods of time; difficulties communicating orally with family and society in general; employment issues; and restricted access to education. It is also positively associated with regular attendance of Deaf gatherings, where sign language is used, and an appreciation of sign language, visual art, sign poetry, etc. Whereas 'deaf' thus indicates an individual's auditory status, 'Deaf' refers to a socio-cultural identity. Those who develop presbycusis – age-related hearing loss – are not likely to identify with this latter construct. Conversely, hearing children

of Deaf parents may identify themselves as Deaf if they are native signers and grew up in a Deaf world.<sup>15</sup> In the present thesis, a capital letter 'D' is only used to indicate the social construct of Deafness in urban signing communities, but not when referring to deaf individuals from Bengkulu. The observations underlying this decision are explained below.

Deaf signers from Bengkulu do not experience the same social inequalities that many Deaf signers from urban signing communities do. Most crucially, the deaf individuals of Bengkulu do not seem to experience the same communication problems as Deaf members of urban signing communities. That is, in Bengkulu, parents who are faced with the birth of a deaf child will learn to sign without exception if they cannot already. As described above, more than half of the hearing population know the sign language (Marsaja 2008:96-100). In daily life, therefore, the deaf individuals of Bengkulu will not often face someone who is unwilling or unable to communicate with them in sign. In the rare instances when signed communication is not possible directly using Kata Kolok, signed interpretation is readily available. Moreover, many village activities are shared between deaf and hearing villagers. These include Hindu ceremonies as well as shared responsibilities such as village security. In these joint activities the deaf villagers are well-integrated into the wider hearing community. The integration of deaf villagers is also mirrored by the fact that they have equal chances of getting married and similar professional opportunities (Branson et al. 1999). The deaf children of Bengkulu are not usually sent away to boarding schools. Although there are three recent exceptions to this rule, this is not likely to become a common pattern, as inclusive education for deaf children has been available in the village since the summer of 2007. While many Deaf people seek out other Deaf people for

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<sup>15</sup> 'Children of Deaf adults' are referred to by the acronym CODA.

social activities, the deaf individuals of Bengkala do not engage in activities with the larger Indonesian Deaf community.

Although deaf individuals in Bengkala do not share the same kind of struggles as deaf individuals outside the deaf village, there are some indications that inside the village, too, a social construction of deafness may be found, which is shared by both deaf and hearing villagers. Most strikingly, all villagers believe in a deaf god who dwells in the village cemetery. Secondly, deaf villagers are referred to in a different yet positive way that distinguishes them from hearing villagers. In general, Balinese people are called by their first name, which is determined by the birth order within a family. For example, the fourth child in a family is called Ketut, irrespective of gender. When hearing villagers talk about deaf individuals in spoken Balinese, they preface the person's given name with the word *kolok*. For example, a deaf man with the given name Getar would be referred to as *kolok Getar*. *Kolok* is a title meaning 'deaf,' and although the use of the word *kolok* is considered pejorative in other parts of Bali, this does not seem to be the case in Bengkala. In fact, the *kolok* men are often characterised as particularly strong yet sensitive, and dominate the village's civil defence brigade for this reason (see also Marsaja 2008:72). The deaf men are also responsible for burying the dead. In Indian Hinduism, the *dalit*, or "casteless" are responsible for burials. However, Covarrubias (1950:53) reports that there has not been a *dalit* caste in Bali, and it is therefore remarkable that the deaf community members have taken on this responsibility.

A third piece of evidence for the social construction of deafness in Bengkala stems from the existence of a 'Deaf Alliance' (Marsaja 2008:73). Deaf men, sometimes joined by deaf women, will gather in a ritual to slaughter an animal and prepare *lawar* (chopped meat and vegetables with spices) followed by the sharing of *tuak* (palm wine). At these deaf gatherings a deaf dance is often performed, called the *janger kolok* (see also Marsaja 2008:75). At the start of the ritual, the

deaf men sit in a semicircle. The *kolok* leader taps a beat on an empty box, while the other men produce a visual rhythm by arbitrary, waving hand movements. This part of the dance is also accompanied by regular high-pitched yells from the deaf signers. After several minutes, one of the men will get up, drink a glass of *tuak*, and enter the semicircle; he then performs a dance that mimics martial arts. The *janger kolok* is also performed on more formal occasions, such as Indonesia's annual Independence Day on 17 August. On these occasions no alcohol is involved, the *kolok* wear special uniforms, and a few women may join the dance. See Figure 2.2 below for an impression of such a formal performance of the *janger kolok*.



**Figure 2.2** The *janger kolok*, a deaf dance

Table 2.2 (on p. 33) summarises the differences between previously documented urban Deaf communities in the Western world and the situation in Bengkala. It is clear from these differences that the cultural identity of the deaf villagers of Bengkala does not map onto previously established socio-cultural notions of Deafness directly. The engagement in many social and religious activities and the wide-spread use of Kata Kolok also reveals that the deaf villagers of Bengkala have an identity that is shared with hearing villagers and linked to their clan membership and to the village. Furthermore, based on the existence of a Deaf Alliance, the *janger kolok*, and village offices reserved for the deaf, in particular, it seems that they have an additional social-cultural identity linked to their deafness. Unlike a Deaf identity, this identity does not extend outside the village, and the deaf people of Bengkala do not engage in Deaf community activities. As indicated previously, a capital letter ‘D’, in the present thesis, is therefore only used to indicate the social construct of Deafness in urban signing communities, but not when referring to deaf individuals from Bengkala. The Balinese term *kolok*, used by Marsaja (2008) and Perniss and Zeshan (2008), is not adopted here either, because the term has a pejorative connotation in certain parts of Bali. By using the term ‘deaf’ it is hoped that a neutral position is taken with respect to the cultural identity of Bengkala’s deaf inhabitants.

	URBAN DEAF COMMUNITIES (LADD 2003)	BENGKALA
Sign language	<ul style="list-style-type: none"> <li>▪ Cultural Deaf identity linked to the use of sign language</li> <li>▪ Hearing people using sign language are interpreters and/or relatives of deaf individuals</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sign language is shared between deaf and hearing community members</li> <li>▪ Neutral attitude towards sign language</li> <li>▪ No formal interpreters</li> </ul>
Education	<ul style="list-style-type: none"> <li>▪ Attendance of boarding schools for the Deaf</li> <li>▪ Substantive amounts of the curriculum may consist of speech therapy</li> <li>▪ Limited access to higher education</li> </ul>	<ul style="list-style-type: none"> <li>▪ Most deaf community members, similar to many hearing community members, are illiterate.</li> <li>▪ Recently established deaf school in the village uses Kata Kolok as the language of instruction teaching numeracy and literacy skills, and general knowledge</li> <li>▪ In recent years three deaf teenagers have</li> </ul>

		attended a deaf boarding school in the south of Bali, which uses a variety of Indonesian Sign Language
Community activities	<ul style="list-style-type: none"> <li>▪ Use of sign names</li> <li>▪ Deaf individuals prefer to engage in Deaf community activities at Deaf clubs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Use of sign names</li> <li>▪ Deaf community members engage in social and religious activities with hearing clan members</li> <li>▪ Deaf Alliance among deaf men and their hearing relatives (approved by the regional government in January 2012)</li> <li>▪ <i>Janger kolok</i> (deaf dance group)</li> </ul>
Marriage	<ul style="list-style-type: none"> <li>▪ Deaf individuals may prefer Deaf spouses</li> </ul>	<ul style="list-style-type: none"> <li>▪ Deaf and hearing people have equal chances at marriage</li> <li>▪ Deaf people are equally likely to marry a deaf or a hearing person</li> </ul>
Profession	<ul style="list-style-type: none"> <li>▪ Deaf individuals are at a disadvantage in finding employment</li> </ul>	<ul style="list-style-type: none"> <li>▪ Deaf and hearing community members have similar occupations.</li> <li>▪ Special offices are reserved for the deaf men: village security, burying the dead, waterpipe maintenance</li> </ul>
Other		<ul style="list-style-type: none"> <li>▪ Deaf and hearing community members share a belief in a deaf god</li> </ul>

**Table 2.2** Social construction of deafness in urban Deaf communities and Bengkala

### 2.3 *Size of the signing community*

One of the most famous studies of a village sign language is of Martha's Vineyard. Groce (1985) recorded one of the hearing signers of this deaf village saying that "...everyone here spoke sign language". This quote, which is the title of Groce's book, may have been misleading, as it is nowadays often assumed that everyone in a deaf village uses sign language (Nonaka, Nyst, & Kisch 2010). This section evaluates a sociolinguistic survey conducted by I Gede Marsaja in 2000 to assess the size and extent of the Kata Kolok signing community. Bearing in mind that Bengkala's population has since increased to 2,740, Marsaja's survey remains the most accurate source of sociolinguistic information to date. The sections below therefore take Marsaja's 2000 survey as a vantage point.

Marsaja co-ordinated a sociolinguistic survey of 1,817 villagers, which was 83% of the total population of Bengkala (Marsaja 2008:96). The survey identified

47 deaf signers, 1,208 hearing signers, and 562 non-signers in Bengkulu (see Table 2.3). From this number one might extrapolate that the ratio of signers and non-signers in the village is roughly 2:1. However, there are some indications that this estimate may be too generous. All the deaf villagers and all of their hearing relatives were included in the survey, and Marsaja's sample was therefore skewed to include signers. Conversely, the villagers who did not participate in the study were all hearing people without deaf relatives and are therefore less likely to be signers (Marsaja 2008:96). The most conservative estimate of the percentage of signers in the village would thus assume that those not included in the survey were non-signers.

LEVEL OF PROFICIENCY	NO. OF VILLAGERS	%
signers (deaf and hearing)	1,255	(69)
non-signers	562	(31)
total surveyed group	1,817	(100)

**Table 2.3** Signers and non-signers in Bengkulu  
(based on the survey from 2000 by Marsaja (2008:96-100) - figures in brackets are percentages of the total number of Kata Kolok signers in the surveyed group)

The total village population at the time of the survey was 2,189. The group of hearing people that did not participate must therefore have comprised approximately 372 individuals (17% of 2,189). As mentioned above, the survey identified 562 non-signers and 1,208 signers.<sup>16</sup> Table 2.4 summarises the frequency counts described above. When those who were not surveyed are considered non-signers, the total percentage of non-signers is 43% and the percentage of signers falls to 57%. If we assume that the ratio within the surveyed group is representative of the whole village, maximally 69% of Bengkulu's villagers sign. The percentage

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<sup>16</sup> Marsaja (2008:100) remarks that the 562 non-signers included 77 children under the age of four years, and that they may become prospective signers.

of signers in Bengkulu, including deaf and hearing, fluent and non-fluent signers thus lies between 57% and 69%. The total number of Kata Kolok signers was therefore between 1,200 and 1,500 villagers at the time of the survey. Assuming the percentage of hearing signers has remained stable, and given the increase of the population size since 2000, the present-day number of hearing signers could even be higher: between 1,500 and 1,900 villagers. This is still a comparatively low figure compared to communities of urban sign language users. Sign Language of the Netherlands, for example, one of the smaller urban sign languages, has been estimated to have as many as 16,000 signers (Commissie Nederlandse Gebarentaal 1997 cited by Crasborn 2001).

LEVEL OF PROFICIENCY	NO. OF VILLAGERS	%
signers (deaf and hearing)	1,255	(57)
non-signers	562	(26)
non-participants	372	(17)
total population of Bengkulu	2,189	(100)

**Table 2.4** Signers and non-signers in Bengkulu (total population)  
(based on the survey from 2000 by Marsaja (2008:96-100) - figures in brackets are percentages of the total number of inhabitants of Bengkulu in 2000)

#### 2.4 *Acquisition of Kata Kolok*

Granting that many villagers use sign language, there are, nevertheless, large differences in the degree of fluency among Kata Kolok signers. This section charts these levels of fluency and the related patterns of language acquisition within the village. This analysis, based on Marsaja's 2000 survey, allows comparison of the composition of the Kata Kolok signing community to the structure of urban signing communities. Marsaja asked a deaf Kata Kolok signer to indicate the fluency of each hearing villager after a short house visit: villagers were categorised as fluent, non-fluent, or non-signer.



Initially, Marsaja identified forty-seven deaf signers and seventy-eight extended family members of deaf individuals in his study (Marsaja 2008:97). The deaf individuals have received sign language input from birth, and thus started to acquire Kata Kolok from birth. They are therefore all native signers.<sup>17</sup> Moreover, Marsaja observes that all of the hearing extended family members of deaf villagers are fluent signers. In my own experience, based on extensive fieldwork, a considerable portion of these extended family members may even be classified as *native signers*. This is true especially when these hearing individuals have older deaf relatives. That is, in Bengkulu, deaf and hearing family members all live in a single compound and hearing children reared in such contexts thus acquire Kata Kolok from a very young age as they interact with deaf children and deaf adults regularly from birth. Marsaja, too, notes this phenomenon by saying:

“These people with Deaf parents and/or siblings are essentially native signers, and are the second most regular and frequent users of the sign language after the D [Deaf] group.”

Marsaja 2008:99

In addition to hearing extended family members, Marsaja identifies 449 fluent signers among the hearing people who do not have deaf relatives (Marsaja 2008:99). Another 681 signers were considered to be non-fluent, but are used to interacting with deaf individuals, too, and can understand most of what is signed to them.

Table 2.5 presents an overview of the degrees of fluency in the Kata Kolok signing community based on Marsaja’s survey. The table reveals that the number

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17 There is one recent exception to the rule that all deaf signers of Bengkulu are native signers. Since Marsaja’s survey in 2000 two deaf women have married deaf men from Bengkulu. One of these women grew up as a home signer and another acquired the sign language used at a deaf school in Singaraja. Both women have since become fluent in Kata Kolok.

of native Kata Kolok signers is extremely limited: a maximum of 10%, when hearing extended family members of deaf signers are all included, but potentially as little as 4% of Kata Kolok signers, when only deaf signers are included as native sign language users.

LEVEL OF PROFICIENCY	NO. OF SIGNERS	%
deaf signers – fluent and native extended family members of deaf individuals	47	(4)
– fluent and native (some)	78	(6)
hearing signers – fluent	449	(36)
hearing signers – non-fluent	681	(54)
Total number of signers	1,255	(100)

**Table 2.5** Degrees of fluency in the Kata Kolok signing community  
(based on the survey from 2000 by Marsaja (2008:96-100) - figures in brackets are percentages of the total number of Kata Kolok signers in the surveyed group)

Two additional observations can be made about the constitution of Kata Kolok's signing community from Marsaja's survey. First of all, as Table 2.6 shows, the majority of Kata Kolok signers, 681 out of 1,255 in the survey, are non-fluent (54%).

FLUENCY	NO. OF SIGNERS	%
fluent signers (incl. native signers)	475	(46)
non-fluent signers (hearing)	681	(54)
Total number of signers	1,255	(100)

**Table 2.6** Fluent versus non-fluent Kata Kolok signers  
(based on the survey from 2000 by Marsaja (2008:96-100) - figures in brackets are percentages of the total number of Kata Kolok signers in the surveyed group)

Secondly, the vast majority of Kata Kolok signers (96%) are hearing (see Table 2.7). These hearing Kata Kolok signers are bimodal bilinguals, that is to say, in addition to Kata Kolok, they also use spoken Balinese on a daily basis. Bahasa Indonesia, Indonesia's national language, is used by educated villagers in the

village school and other formal settings (Marsaja 2008:84), but it remains unclear at present what percentage of the village population is fluent in the language, or uses Bahasa Indonesia in everyday interaction.

SIGNERS' AUDITORY STATUS	NO. OF SIGNERS	%
Deaf signers – fluent and native	47	(4)
Hearing signers	1,208	(96)
Total number of signers	1,255	(100)

**Table 2.7** Hearing versus deaf Kata Kolok signers  
(figures in brackets are percentages of the total number of Kata Kolok signers)

To my knowledge, there is no comparable survey on the levels of fluency or proficiency of urban signers, nor is such detailed statistical information available for urban signing communities. There are, however, a few ways in which the patterns of language acquisition for Kata Kolok seem to deviate from those of urban sign languages around the world. Firstly, all deaf children in Bengkulu receive linguistic input from birth, and thus language acquisition begins at birth. Deaf children in Bengkulu thus benefit from a rich linguistic input, as they are surrounded by numerous fluent adult signers. Contrastingly, most deaf children in urban societies are born to hearing parents who have no knowledge of sign language, and consequently there are few signers who have access to full linguistic sign language input from birth. It is estimated that between five and 10% of deaf children in Western societies acquire sign language from adults who are themselves native signers (Schein & Delk 1974; Kyle & Woll 1985; Neidle et al. 2000), but the number could be even lower in the case of smaller deaf communities (Costello, Fernández, & Landa 2006). Furthermore, even when urban deaf children receive full linguistic input from birth, from Deaf signing parents, it is not common for many of the child's relatives also to be native signers. Deaf children growing up in Bengkulu thus have a comparatively rich linguistic environment, not only with their parents, but also with extended family members who are fluent signers.

There are as yet no studies of first language acquisition in this type of deaf village setting, but during the course of this project, longitudinal child signing data were collected (see also section 3.4.4).

A second contrast to urban signing communities is the fact that there are many more hearing signers than deaf signers, and the total percentage of hearing signers is 96% of all signers. In urban signing communities it is, for the most part, CODAs, interpreters, and hearing parents of deaf children who learn to sign, and who are bimodal bilingual. As mentioned above, it has proven difficult to find statistical information on urban sign languages for comparison. In the case of the Sign Language of the Netherlands (NGT) it is estimated that hearing signers constitute approximately one third of the total number of sign language users (Commissie Nederlandse Gebarentaal, 1997 cited by Crasborn 2001). Although this number may vary from one urban signing community to the next, it is inevitable that the number will be considerably lower than the 96% of hearing signers reported in the case of Kata Kolok. Based on this pattern, it might be hypothesised that the influence of spoken Balinese on Kata Kolok might be more extensive than is the case for urban sign languages and the spoken languages that they have contact with. However, this does not appear to be the case, and this is a recurring theme throughout the thesis (see sections 4.3.1 and 4.9.4, in particular). More than half the Kata Kolok signers are non-fluent and one may therefore hypothesise that this has had an impact on the sign language. With regard to Adamorobe Sign Language, for example, Nyst (2007a:209) suggests that the comparatively ‘lax’ articulation of signers could be the result of the fact that this village sign language has a large number of hearing, non-fluent signers. Studies have shown that a high percentage of second language users of spoken languages may also reduce the morpho-syntactic complexity of a language (see for example Szmrecsanyi & Kortmann 2009 on varieties of English). As previously mentioned, there are no known large-scale studies of levels of proficiency within urban deaf

communities, and it is not easy to compare such a statistic with the fluency of signers in deaf villages. A vital step, in order to assess the extent to which the patterns of language acquisition play a role in the structure of village sign languages, is to compare the structural differences of Kata Kolok as it is used by deaf and hearing community members, and for this reason the Kata Kolok corpus has a special section on deaf-hearing interaction (see p. 73).

### 2.5 *Time depth of Kata Kolok*

Estimating the age of a sign language is difficult. First of all, the question of Kata Kolok's time depth in part depends on how we define a language. Section 2.2 has made clear that Kata Kolok is manifest in all major facets of life (religion, education, occupation, gossip, etc). Furthermore, at present Kata Kolok is the main means of communication for deaf individuals of all age groups, therefore it has evidently been the *first language* of multiple generations of deaf individuals. Both of these observations lead to the conclusion that Kata Kolok is a fully-functional language at this moment in time. The question of how long it has been a fully-functional language, however, is harder to answer.

A second issue in determining the time depth of a sign language is the fact that, unlike many spoken languages, there have been no known means of preserving the content or forms of signed utterances for future reference at a later point in time. It is only recently that technological advancements have enabled the recording and preservation of video data in a way comparable with the quality of audio data. Moreover, while many spoken languages have orthographic representations, efforts to write down signed communications have only recently been undertaken for the purposes of research and deaf education, presumably because of the difficulties in capturing the high degree of simultaneous information (see Zwitserlood 2010 for an overview of sign language orthographies). With no records of the language of communication with and between deaf people in Bengkulu prior to 1987 (Marsaja

2008:56), the evidence involved in estimating the time depth of Kata Kolok is necessarily circumstantial. Therefore, we need to take into account the relative reliability of these sources. In subsequent sections, an attempt will nevertheless be made to estimate the age of Kata Kolok, informed by an evaluation of anthropological evidence (Hinnant 2000; Marsaja 2008:53-60) and genetic research stemming from the early 1990s (Friedman et al. 1995; Morell et al. 1995; Winata et al. 1995; Liang et al. 1998; Friedman et al. 2000). I argue that Kata Kolok is most likely to be in its fifth generation.

To begin with, Marsaja (2008) discusses some indirect historical evidence that Kata Kolok might be much older than stated here. There are however several reasons to believe that the sources Marsaja cites are not reliable enough to draw any final conclusions concerning the time depth of Kata Kolok. The document cited by Marsaja was drawn up as late as 1987, and reports a myth on how deafness came into the village. It is believed that a childless couple prayed to a deaf god for a child, and following this, the couple had many children, including a deaf child. Within this written document, the birth of a first deaf child is placed before the establishment of Bengkala. The second piece of evidence relates to the age of the village, as accounted by a document believed to be a translation of the *prasasti* (inscribed bronze plates reporting the history of the village). Unfortunately, none of the community members is currently able to read the *prasasti*, as they are written in Devanagari script, but according to the translation, the Bengkala community moved across Bali, inhabiting various settlements between 400 and 800 AD. The settlements referred to in the document are still there today, and interestingly these villages share a belief in a deaf god. Based on this evidence, one might place the emergence of Kata Kolok before 400 AD. As Marsaja reports, however, contact between Bengkala and the nearby villages of Pakuan, Sinabun, and Suwug has been sustained through religious ties; villagers from Bengkala, including the *kolok*, still have regular ceremonial duties at the

temples of these villages. The cultural significance of deafness as expressed by the existence of a deaf god could thus have resulted from this prolonged contact, rather than from the existence of a sign language more than two millennia ago.

The current demographics of deaf Kata Kolok signers may inform us of the development of Kata Kolok, too. On my first fieldwork visit, I met one deaf man who must have been born before 1939 as he was the father of one of the older deaf men in the village and had vivid memories of the Second World War, which he witnessed as a young man. This man reported to have deaf parents, and the age of this oldest, fluent deaf signer thus forms the minimal time depth of Kata Kolok. According to Marsaja's demographic investigations, in the year 2000 this man had already reached the age of 70+ (2008:78). Hence, the minimum age of Kata Kolok is 80+ years. When we include his parents' generation it may be even older than that.

According to genealogical research conducted in the early nineties by Liang et al. (1998), the first deaf villager was born seven generations ago. The family tree, which was produced after extensive anthropological fieldwork, concludes that this first deaf individual was followed by a generation of no deaf children being born, but with multiple deaf villagers in successive generations, thus sustaining the communicative need for sign language. Figure 2.3 presents the family tree produced by Liang et al. (1998). This diagram is still largely accurate, although in recent years individuals 126, 127, and 58 have passed away. Three deaf girls were born in a marriage between individuals 132 and 206, and the marriage between individuals 39 and 124 resulted in the birth of another deaf son. The lifetime of the first generation to include multiple deaf individuals, indicated as generation III in the genealogical tree, will be taken as the starting point of the emergence of Kata Kolok, as it is assumed that some form of sign language will emerge so long as

there is interaction among a group of deaf individuals.<sup>18</sup> How can we determine the timing of the sudden rise of the incidence of deafness which led to the emergence of Kata Kolok? The following sections discuss how the research of Liang et al. may help us address this question.

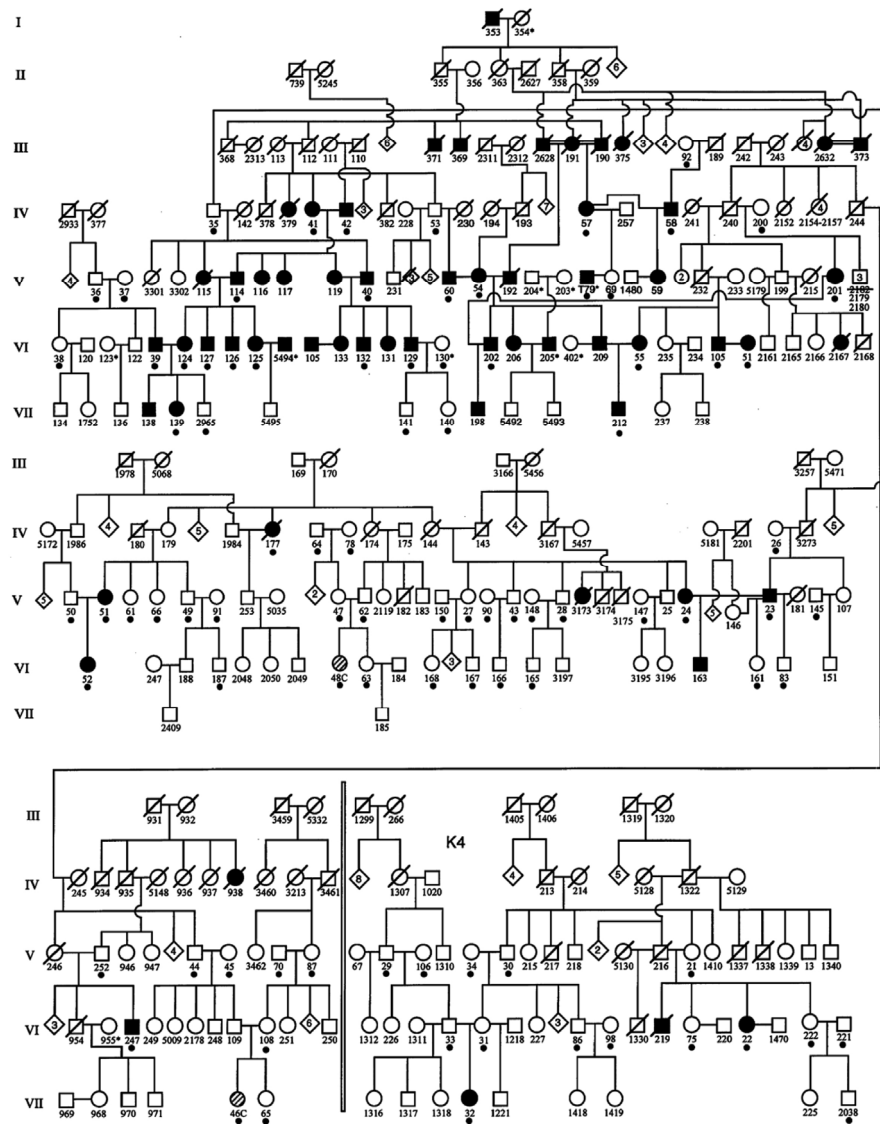
In the early 1990s, the Balinese government asked several medical experts to conduct research into the cause of deafness in Bengkala.<sup>19</sup> It was found that the majority of deafness in Bengkala has the same non-syndromal and recessive genetic cause. This cause is a mutation in the gene *DFNB3*, labelled as such following accepted nomenclature showing that it was the third deafness-causing gene identified that is inherited in a recessive pattern (Winata et al. 1995). This research study narrowed down *DFNB3* to a position within a small section of chromosome 17 using the technique known as genetic linkage, though it was not known at that point exactly where the gene was, nor what protein it coded for. It has only been described in a couple of other populations since.

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<sup>18</sup> At this stage however, the language may have looked more like an extended home sign system. Very little is known at this point about the properties of such incipient sign languages, although both Stephen C. Levinson and John Haviland have studied them in their respective field sites of Rossell Island and Yucatan (Mexico). Presumably these extended home sign systems exceed the complexities of home sign – the communication between deaf individuals and their hearing interlocutors in the absence of a fully-fledged sign language (Goldin-Meadow 2003).

<sup>19</sup> I would like to thank Rachel Belk (University of Manchester), Dan Dediu (Max Planck Institute for Psycholinguistics), and Jack Fenner (Australian National University) for their help in making sense of the genetic literature on deafness in Bengkala.





**Figure 2.3** Reproduction of the genealogical tree by Liang et al. (1998)

The fact that deafness is non-syndromal in Bengkala means that the gene is one which causes deafness alone without any associated health problems, for example visual problems, kidney problems or differences in appearance such as unusual hair or eye colouring, or differences in the appearance of the outer ear (Winata et al. 1995). The fact that the gene is recessive means that an individual has to inherit two copies of the mutated version of the gene, one from each parent, to be affected by the condition, in this case deafness. This is defined in genetics as being homozygous for the gene mutation. The deafness in Bengkala is sensorineural and is thought to be caused by shortened stereocilia, as it is in mice that are homozygous for mutations in the murine homolog, which is the similar gene in mice which fulfils the same function as *DFNB3* does in humans (Friedman et al. 2000). The stereocilia of the inner ear are hair cells that respond to the fluidic motion caused by sound waves. *DFNB3* was subsequently identified as coding for a protein called myosin XVA and for this reason the gene is now also known as *MYO15A* (Probst et al. 1998). The specific mutation in the Bengkala families was identified shortly afterwards as being a single nucleotide ('genetic letter') change that has not been seen in other populations (Wang et al. 1998).<sup>20</sup>

Winata et al. (1995) looked at the genetic markers close to the *DFNB3* mutation, to see how often the chromosomes had crossed, broken and rejoined to recombine the sequence of markers. Alongside this, knowledge of how frequently this genetic recombination occurs on average is an established molecular genetics tool to estimate the timescale of when genetic changes arose. Using this technique, the genetic mutation that causes deafness in Bengkala was estimated to have occurred between 4.2 (SD 1.9) and 8.9 (SD 4.3) generations prior to their research in 1992 (Winata et al. 1995). One standard deviation (SD) indicates the range of

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<sup>20</sup> In spring 2011, several databases were searched for MYO15A and DFNB3 to establish this.

generations that fall within a 66% probability range. In other words, there is a 66% chance that the *DFNB3* mutation took place within  $(8.9 + 1 \text{ SD})$  13.2 generations. Two standard deviations removed, indicate a 95% probability. With respect to *DFNB3*, this means that the chance that this mutation took place over 17.5 generations ago is 5% or less.

The genealogical tree created by Liang et al. (1998) is compatible with the outcomes of the genetic research. Since the *DFNB3* mutation is recessive, deafness is not expected to occur within the first three generations after the mutation first occurred. This event would have gone unnoticed; the effect of a recessive gene is not seen unless an individual carries two mutated copies of the gene. It transpires that procreation occurred between two carriers of the mutated gene. Although it is possible that close relatives might get married, it is more likely that two cousins, or even relatives further removed, got married and had offspring. Furthermore, multiple deaf children would not be expected until at least two generations after the first deaf individual. That is, the hearing sons and daughters of the first deaf individual would only carry one mutated variant of the gene. This means they would only have produced deaf offspring themselves if they married distant relatives with the same *DFNB3* mutation. Liang et al.'s compilation of the village's lineages suggests that this is indeed what happened.

Liang et al.'s description is based on structured interviews by an anthropologist who lived in the village for two years in the early 1990s (see Hinnant 2000). According to the older inhabitants of Bengkala, the first deaf individual was born into the village seven generations earlier. It can be inferred that, because the gene is recessive, it must thus have mutated at least three generations before that time, thus ten generations ago. That is, it would take at least three generations for the first individual to be born who is affected by the mutated gene (unless close relatives had offspring). This number falls within one standard deviation of the values suggested by Winata et al. (1995). Furthermore, it would then take a further

two generations for this first deaf individual to have descendants who are also deaf. Although almost twenty years have passed since Liang et al. conducted their study, biologically speaking, no individuals have been born in the 8<sup>th</sup> generation. This would imply that the first generation to include *multiple* deaf villagers did not appear until five generations ago.

Table 2.8 presents a timeline of the most important events with regard to the emergence of Kata Kolok. The *DFNB3* gene most likely emerged at least ten generations ago. Subsequently, the first deaf individual affected by this gene was born seven generations ago. Finally, the first cohort of deaf individuals did not arise until five generations ago. This event is taken here as central to the emergence of Kata Kolok. To summarise, it seems that the most likely time depth for Kata Kolok is five generations.

EVENTS		GENERATIONS OF SIGNERS	BIOLOGICAL GENERATIONS (SEE Figure 2.3 ON P. 44)
Spread of mutated gene	At least 10 generations ago Mutation of <i>DFNB3</i>		
	7 generations from 2011 First deaf individual affected by <i>DFNB3</i>		I
	6 generations ago		II
	5 generations ago First cohort of deaf siblings Emergence of Kata Kolok	1 <sup>st</sup>	III
	3 generations ago	2 <sup>nd</sup>	IV
Development of Kata Kolok	2 generations ago	3 <sup>rd</sup>	V
	1 generation ago	4 <sup>th</sup>	VI
	Kata Kolok in its current form	5 <sup>th</sup>	VII

**Table 2.8** Timeline of the emergence of Kata Kolok

What can the age of a gene in terms of generations tell us about the time depth of Kata Kolok? In order to interpret the genetic evidence summarised above in terms of years, it is necessary to estimate generation length in terms of years. However, by using a standard estimate for generation length one would introduce a false sense of precision, which the genetic research methods cannot provide. Furthermore, in Bengkala, the biological generations have become highly integrated on a social level. Individuals 116 (from the third generation of signers) and 125 (from the fourth generation of signers), in the diagram on p. 44, are married to the same husband and raise a family together. The children that resulted from the marriage between individual 192 (a second generation signer) and individual 54 (a third generation signer) are counted in the fourth generation of signers. Individual 201 (a third generation signer) married individual 202 (a fourth generation signer) and their son is counted as a fifth generation signer. Individuals 139 and 131 are part of the fourth and fifth generation of signers respectively, but they attend the same deaf school in the south of Bali and are separated by only three school grades. Individuals 133 and 212 (from the fourth and fifth generation of signers) have recently married.

The linguistic analyses in this thesis are predominantly based on signers ranging in age from 20 to 60, from the fourth generation of signers. This methodological decision has been in part pragmatically motivated. The last deaf signer of the second generation passed away soon after my initial visit to the community. Furthermore, during data collection (2006-2009), a number of deaf signers of the fifth generation were younger than twelve years old, and as described below, the sign language use by adolescents from this generation often reflects the increasing influence of Indonesian signing varieties used at deaf boarding schools throughout Bali. The remaining deaf signers from the third and fourth generations of signers were not further differentiated, because the biological generations do not appear to be an appropriate proxy for social interactional patterns in the case of Bengkala

and they are unlikely to determine the patterns of language transmission for this reason. Traditional anthropological methods such as social network analysis may therefore be more appropriate to investigate how the language might have changed in the past few generations of signers (see Kisch forthcoming on the Al-Sayyed Bedouin community in Israel). Nonaka (2009) provides an overview of methodological tools to chart social interactions in deaf villages. Moreover, the work on Nicaraguan Sign Language suggests that cultural cohorts rather than biological generations may be a more appropriate measure in describing the development of a new sign language (Senghas, Kita, & Özyürek 2004). Ultimately, the most appropriate measures to chart a sign language's development would appear to be its time depth in years and the increase of its users across multiple cohorts of signers.

## *2.6 Bilingualism and endangerment of Kata Kolok*

Marsaja (2008:45) notes that the contact between deaf signers of Bengkala and signers in other villages has been limited, because of topographic distance as well as dissimilarities between Kata Kolok and the signing varieties used in other parts of Bali. Between 1994 and 1998 signed interpretation was made available on Indonesia's national television as part of a programme designed to facilitate the integration of deaf people (Branson & Miller 2004). However, signers across Indonesia had difficulty understanding these 'translations' into SIBI, which is not a natural sign language but rather a form of sign-supported speech, and interpreting on television has since been abandoned (Palfreyman p.c. October 2011). Kata Kolok signers might have picked up a few lexical signs used in SIBI through this medium, but it is unlikely given the marked differences between Kata Kolok and SIBI, and there is little evidence that it has happened. In recent years, three deaf teenage girls from Bengkala have entered the deaf boarding school in Jimbaran, in the south of Bali. These adolescents have become fully bilingual in Indonesian

Sign Language and Kata Kolok, and such contact situations often result in linguistic change in favour of the majority language associated with perceived educational and professional opportunities (Nonaka 2004). The attendance of this deaf boarding school has also resulted in increased contact between the Kata Kolok community and the wider deaf community of Bali, resulting in changing marital patterns. That is, the intensification of contact between Kata Kolok signers and Indonesian Sign Language signers has also resulted in an increasing number of deaf individuals from Bengkala seeking out deaf spouses from surrounding villages and other parts of Bali. Because deaf individuals outside of Bengkala are not carriers of the identical recessive gene causing deafness, these couples are unlikely to have deaf offspring. Moreover, this latter tendency, to marry outside the village, is also observed in hearing villagers from Bengkala due to socio-economic change. In effect, these changing marital patterns dilute the frequency of the recessive gene in the population of Bengkala and reduce the incidence of deafness as a result. When the number of deaf individuals decreases significantly, the chances are that the communicative need for the sign language will disappear. Since 2005, no deaf children have been born to parents who use Kata Kolok, and this makes the study of the acquisition of Kata Kolok especially pressing, as another opportunity to study the acquisition of this endangered sign language without the influence of Indonesian Sign Language may not occur again.

## *2.7 Previous linguistic analyses of Kata Kolok*

While considerable information is available on the social context in which Kata Kolok is used, the description of the language did not start until recent years. This section provides an overview of the linguistic publications on Kata Kolok to date in order to situate findings that are presented in parts II-V of the thesis.

Schwager and Zeshan (2008) compare parts of speech in German Sign Language, Russian Sign Language, and Kata Kolok. This comparative research suggests that Kata Kolok is an “isolating” language that distinguishes very few

word classes at the morphological level. Zeshan (2006b) also notes that Kata Kolok's number system lacks the morphological complexity common to other sign languages. The domain of number remains largely unaddressed in this thesis (but see section 4.4, and Zeshan et al. in preparation). Furthermore, while Kata Kolok has entity classifiers, as do other sign languages, these forms are differentiated primarily by movement patterns rather than handshapes (Zeshan 2006b; Marsaja 2008:172ff; section 4.5.1 of this thesis). Perniss and Zeshan (2008) address the domain of existential and possessive constructions in Kata Kolok. They observe a high degree of indeterminacy in these grammatical constructions, often allowing for multiple viable interpretations. They also describe the use of the lexical sign GOOD ('thumb-up') as a possessive marker. All in all, Kata Kolok's limited morphology might mark it out as a discourse-configurational language similar to other South-East Asian languages, but further research is needed to explore this possibility.

No systematic overview of Kata Kolok's lexicon exists at present, but multiple studies report that a number of its lexical signs have general meanings compared to other (sign) languages (Marsaja 2008:202; Perniss & Zeshan 2008:128; Schwager & Zeshan 2008:526f; de Vos 2011; section 4.8.2 of this thesis). This issue is addressed in section 4.3, where differences between the lexica of Kata Kolok and Balinese, as well as similarities among the lexica of village sign languages are described. The comparison of the spoken and signed languages of deaf villages gives a unique perspective on the role of culture in an emerging lexicon (see also de Vos 2011).

Marsaja (2008:120-137) presents an overview of the formational building blocks of Kata Kolok. He categorises Kata Kolok's handshape inventory into basic, regular, and restricted handshapes. Section 4.2.1 adopts Marsaja's categorisation but a few adaptations are suggested. Marsaja (2008:141-152) also describes the types of movement and the places of articulation of Kata Kolok signs.



Kata Kolok's articulatory signing space extends well beyond the boundaries that have been described for other sign languages (Marsaja 2008:160). Section 6.2 describes the ways in which Kata Kolok signers employ the various areas of their signing space for spatial and non-spatial meanings.

Marsaja (2008:202-211) identifies three types of questions in Kata Kolok: content questions, polar questions, and question tags. Kata Kolok has three question signs, and all three question types are marked by the same non-manual marker: raised eyebrows (Marsaja 2008:203). In my view, this is particularly interesting because a number of other sign languages mark content questions by furrowed brows rather than raised eyebrows (see Baker-Shenk (1983) on American Sign Language, Bergman (1984) on Swedish Sign Language, and Coerts (1992) on Sign Language of the Netherlands). In addition to the use of raised eyebrows, content questions and polar questions are marked by an optional backward head tilt, while question tags include an additional head nod (Marsaja 2008:203). Marsaja (2008:194-201) also describes the coordinated use of manual and non-manual forms of the basic clause negator and the negative completive (see also sections 4.9.2 and 4.7.2 of this thesis respectively). This thesis touches upon the use of non-manual markers particular to Kata Kolok in sections 4.6, 4.7.1, 4.7.2, and 4.9.2, but a comprehensive overview of the non-manual markers that are used in Kata Kolok discourse falls beyond the scope of this thesis. The initial observations suggest that a contrastive analysis between Kata Kolok and other sign languages may bring to light further commonalities as well as distinct features of the way Kata Kolok signers adopt manual and non-manual forms in concert.

As mentioned previously, Kata Kolok differs from previously documented sign languages in its use of the signing space in particular. Zeshan (2006a) notes that the language lacks metaphorical uses of the signing space including the use of a timeline, transitive verbs with directional movements, and the use of the signing space to express logical contrasts. Zeshan (2006a) also reports that Kata Kolok

uses absolute spatial reference at the level of individual signs, for time reference, with index finger pointing, and more generally in the spatial set-up of discourses (see also Marsaja 2008:159-171). This thesis follows up on these observations, and they are addressed in more detail in the appropriate sections throughout the thesis (see Part III and Part IV in particular).

## *2.8 Summary and discussion*

Chapter 2 has presented an overview of Kata Kolok and its signing community. The descriptions of the social interactional patterns of deaf and hearing villagers in Bengkala do not warrant straightforward identification of deaf villagers as culturally ‘Deaf’, and the deaf villagers of Bengkala are indicated here by the more neutral ‘deaf’. Of all the inhabitants of Bengkala, 57% use sign language, with varying degrees of fluency. The signing community consists of at least 1,200-1,400 signers of whom only 4% are deaf. Furthermore, 54% of Kata Kolok signers are non-fluent. Finally, an evaluation of anthropological, genetic, and demographic evidence has led to the conclusion that Kata Kolok is currently in its fifth generation. Recent developments suggest that the language has become threatened due to the influence of varieties of Indonesian Sign Language used in other parts of Bali. Previous linguistic analyses have identified multiple domains of comparative interest including a distinct use of non-manual signals. The next chapter discusses how these findings have informed the creation of the Kata Kolok corpus.

### ***3 Research methodology***

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#### *3.1 Overview*

This chapter explains how methods were chosen for creating the Kata Kolok corpus, in light of the current knowledge of Kata Kolok and its signing community set out in chapter 2. Initial ethical considerations with respect to research activities in the community are addressed in section 3.2. Section 3.3 explains why it was considered to be most appropriate to conduct mid- to long-term fieldwork as the linguistic research methodology for this project. I argue that, based on our knowledge of its signing community, the Kata Kolok corpus should include different types of data compared to those usually documented in the corpora of urban sign languages. Most notably, the Kata Kolok corpus includes data from fluent and non-fluent hearing signers in order to properly represent characteristics of the signing community. Notwithstanding these additions, the linguistic descriptions provided throughout this thesis are based on deaf native signers of Kata Kolok, in order to optimise comparability with other sign languages. The methodology used for the Kata Kolok corpus is summarised in section 3.4. Potential functions for the corpus are also explored in this section.

#### *3.2 Ethical aspects with respect to fieldwork*

Fieldwork activities in Bengkala have been conducted in a way that optimises respect and fairness towards the community. Section 3.2.1 describes how consent was obtained for the research project from designated stakeholders. Section 3.2.2 reports on the initiation of a deaf education project in the village. Given the fact that most Kata Kolok signers are hearing villagers, this group of signers was also involved in this educational programme from the start. Other aspects of community involvement are addressed in section 3.2.3.

### 3.2.1 Obtaining consent

The first step in ensuring the robust ethical standards for the research was to seek the permission of local authorities: the village head (I Made Astika) and the leader of the deaf villagers (I Wayan Getar). Bengkala had already had experience of visiting researchers from the fields of genetics, anthropology, linguistics, and sociolinguistics at the time, and was therefore able to evaluate the proposal. An important factor in this initial request was the involvement of one of the hearing signers from the village: Ketut Kanta. Ketut Kanta is a well-respected member of the community, which is evident from the fact that he was selected to become village head in 2005. He declined this office because of professional responsibilities abroad, but has been engaged in local politics for many years. His international experience and prior familiarity with the author enabled fieldwork activities to be facilitated smoothly. Ketut Kanta was also involved in previous research projects as an assistant and, as a teacher of the deaf children in the village, he has a good relationship with the deaf families (see also Kortschak 2010). Over the years, he has become a spokesperson for the deaf villagers and interprets requests from outside visitors into Kata Kolok fluently.

Naturally, Ketut Kanta consulted the deaf villagers before agreeing to become a research assistant for this project. He also explained to the deaf participants in the study, using Kata Kolok, what the aims of the project were: to document the language, to compare Kata Kolok to the sign languages of other deaf people, and to educate people about the differences between sign languages. Kata Kolok signers can relate to the issue of cross-linguistic variation between sign languages, as many of them have had difficulty understanding signers from other parts of Bali.<sup>21</sup> Deaf participants were also assured that the researcher would not seek financial benefits

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21 Nick Palfreyman is currently charting the signing varieties of Indonesia within his PhD research project at the International institute for Sign Languages and Deaf Studies at the University of Central Lancashire in Preston, UK.

from conducting this research by selling research publications. On the basis of these conversations in Kata Kolok, consent forms were drawn up in Indonesia's national language: Bahasa Indonesia. Both the Indonesian consent form and the English version of the form, on which the translation was based, can be viewed in Appendix I. The Indonesian consent forms were discussed in Kata Kolok and sometimes read by hearing, literate family members of the deaf. Afterwards, the forms were signed by each of the deaf villagers stating that they agreed to have their videos recorded, stored, and analyzed by both the Max Planck Institute for Psycholinguistics and the International Centre for Sign Languages and Deaf Studies at the University of Central Lancashire. Most participants preferred to indicate their consent by providing a finger print, as they have not learnt how to read or write. In the case of children below 16 years of age, both the children and the parents provided finger prints. For each of the recording sessions, participants were paid a locally appropriate salary equalling one day's labour, as a compensation for any income that they would have received had they gone to work.

All deaf signers in the village agreed to have their data stored and analyzed for research. However, none of the participants provided additional consent for their data to be published online, photos to be published in print, and/or videos to be shown at conferences. In a few cases, including all the pictures in the thesis, I have nonetheless obtained consent for specific pictures and video clips, after consulting with the individual signers, and their parents when necessary. In my opinion, the fact that signers decided not to permit these types of publication in advance, clearly demonstrates that they were able to make an informed decision concerning their involvement. The Kata Kolok data have been archived digitally at the Max Planck Institute for Psycholinguistics and the International Institute for Sign Languages and Deaf Studies (see also section 3.4). Media files that contain sensitive information have been marked as such in the metadata files. These metadata files

are accessible online, but the video files are not, although restricted permission can be granted by the author upon request.

### 3.2.2 Deaf education program

In consultation with the deaf villagers it was decided that they could benefit from a literacy programme so that deaf children could go to school just like hearing children. From the conception of this idea onwards, several educational approaches were trialled. These initial steps included teaching adults literacy in the evenings, and a separate class room for deaf children outside school premises. These endeavours failed due to the absence of proper materials and accommodation, limited didactic experience, and an overall lack of consistency. A stable deaf education programme was not accomplished until local authorities got involved. The formal application to initiate a local ‘inclusive’ deaf education programme was filed by the following individuals: I Made Wijana (the Head of the Elementary School No. 2), Drs. Putu Risma (the Head of the School for the Deaf (SLB) in Singaraja), I Made Astika (the Village Head), I Ketut Kanta, and the author.<sup>22</sup> Pak Wijana agreed to house the deaf school in his school grounds at elementary school No. 2 in the village. It goes without saying that the mutual trust and respect required to engage in this joint effort, which led to the success of the deaf school, only became possible after a considerable amount of time spent with the community.

There are seven deaf students currently enrolled, three of them are aged 6, and the other three children are aged 11, 14, 15, and 16. The deaf children are taught to read and write Bahasa Indonesia, mathematics, and general knowledge, but they do not receive speech therapy. The children have a separate classroom in the school, which was financed by the Indonesian government in 2008. This classroom is

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<sup>22</sup> This educational programme is officially registered as an *inclusive education programme*; the content of the educational process is described in more detail below.

mostly used for teaching Indonesian literacy, and the walls have several visual images of common objects and their Indonesian names. Kata Kolok is used as the language of instruction and communication in the class room. In general activities such as sports, cleaning, or praying, the children join the hearing students. When the school is understaffed, the deaf students join the larger hearing classroom, too, but students receive separate instruction in Kata Kolok in this case. Since most of the hearing children in the school are familiar with signed communication and have had experience with sign language from an early age, they automatically sign to the deaf students in the playground. The hearing children in the school have also learnt how to fingerspell words.

This deaf school would not have been possible without the initial financial and technical support of the Max Planck Institute for Psycholinguistics. The project currently receives funding from the Indonesian and Balinese governments as well as from a Dutch foundation called *Vrienden van Effatha*. Leen and Tineke Molendijk are the current ambassadors for the project at this foundation. As a retired teacher of the Deaf, with forty years of experience, Mr. Molendijk is able to advise and support the project with professional skill. During 2010, Mr. and Mrs. Molendijk visited the school twice, for one month at a time, and they plan to do likewise in the coming four years. During these visits Mr. and Mrs. Molendijk have shared their didactic skills with the school and have brought educational materials (such as puzzles). They also developed materials specific to Kata Kolok based on pictures from I Gede Marsaja's (2008) book. Current objectives include finding vocational training for the teenage boys, aged 14, 15, and 16, who entered the school. Given the fact that no deaf children have been born since 2005, the deaf school faces the prospect of being discontinued in future. Despite the fact that the village is largely illiterate, the school has made a positive contribution to the self-esteem of the deaf students who entered (Kortschak 2010).

### 3.2.3 Community involvement

The previous sections have shown how the local authorities and deaf villagers of Bengkulu have been involved in the project from start to finish. It is important to realise, however, that, given that more than half of the villagers of Bengkulu use the sign language, hearing villagers are stakeholders in the research process too. By excluding them from the research process, we would be ignoring 96% of Kata Kolok signers. In a way, these hearing signers share in a deaf village identity along with their deaf relatives, friends, neighbours, and colleagues. Deaf signers of urban sign languages have a sense of ownership over their sign languages and are therefore involved in dictionary projects, for instance. Conversely, in the case of Bengkulu, Kata Kolok may better be viewed as a communication tool shared by both deaf and hearing.

There are three ways in which I have attempted to take these sensitivities into account. First of all, hearing signers, of various degrees of proficiency, were explicitly asked to contribute to the corpus. This decision was made based on methodological considerations as well, and this issue is addressed in more detail in 3.4.1. Secondly, given the idea that Kata Kolok belongs to the village as a whole, rather than to the deaf villagers alone, a local copy of the video data, on an external hard drive, was provided to the village administration, after the end of the project. Thirdly, to ensure the accessibility of these video files for future generations, sentence translations of video recordings were made in Bahasa Indonesia as well as English. Hearing villagers will therefore be able to access the Indonesian translations should Kata Kolok disappear. Translations into Bahasa Indonesia also ensure access to the files for other Indonesians. At the initial stages of fieldwork, the researcher has provided copies of previously published work on Bengkulu and Kata Kolok to the village administration, as requested by the village head and the research assistant. This thesis will also be made available to the community in due course.



### 3.3 *Linguistic fieldwork*

Data collection for the project was based on fieldwork. I stayed in the community for several months at a time for a total period of 11 months. The advantages of spending a considerable amount of time in the field site, as opposed to collecting much data in a short time of space, are numerous. For this project, two types of considerations played a role in the decision to make mid to long-term visits. There are ethical issues that call for such an approach in this particular case, and this may also apply to other deaf villages. Section 3.2 addressed these ethical aspects pertaining to linguistic fieldwork in more detail. It would also have been difficult to address the specific research aims of the project without in-depth knowledge of the community, which is attainable for a linguist during such visits.

For a descriptive linguist, the most obvious reason for conducting mid to long-term fieldwork is to enable a linguist to become immersed in the language(s) under consideration. During fieldwork visits, I interacted with many deaf signers on a daily basis. The settings in which I would interact with these signers were as varied as possible, ranging from religious ceremony preparations, to farming activities in the rice fields, and evening chats. The frequency and variety of language situations enabled me to take in as much of the language as possible. During the project I acquired Kata Kolok to a degree whereby I could converse with deaf individuals fluently. As my interactions with hearing villagers were far less frequent, my knowledge of spoken Balinese and Bahasa Indonesia has remained limited. The process of learning a new language is not easy, and even experienced field linguists sometimes reach the conclusion that they have not grasped the meaning of a particular word in one attempt (Enfield forthcoming). Time is needed to allow for incorrect hypotheses to be falsified. It may also take a while to encounter infrequent yet very interesting phenomena. One of the wonders of fieldwork is that new leads for future work invariably emerge. For these reasons and others, fieldwork is an incredibly fruitful linguistic research methodology.

A second reason to spend time in the village is to acquire knowledge of local customs and beliefs that are required to understand contexts fully. For example, the fieldwork for this project presented an important opportunity to learn about Balinese Hinduism. Religious ceremonies are central to the daily lives of villagers, and are a frequent topic for conversation. In particular, women might discuss the laborious process of preparing offerings, while men sometimes discuss the types and number of animals to be slaughtered. Such culturally entrenched discourse is not easily interpretable for an outsider. One of the specific research questions for this project focused on Kata Kolok's pointing system (see Part V of the thesis). One of the characteristics of Kata Kolok pointing signs is that, with rare exceptions, they are directed at geographic locations. This makes Kata Kolok discourse highly context-dependent. Were one to take these video recordings and try to annotate them outside of the village, problems would inevitably be encountered in identifying the locations pointed at, and I received a considerable amount of help from Ketut Kanta in doing this while we were transcribing.

Thirdly, one of the anticipated outcomes of the project was the creation of a corpus, and linguistic fieldwork allowed me to observe the types of settings in which the language is used, and how a representative selection of the language used in these varied situations can be added to the corpus. These observations have led to the inclusion of hearing signers with varying degrees of proficiency as well as the inclusion of infant-caregiver interactions, and signers who are sign-bilingual between Kata Kolok and Indonesian Sign Language. Observations in the field have also led to the collection of a variety of discussion topics, as summarised on p. 69.

Finally, not only does it take time for a researcher to become accustomed to the local norms that co-exist with the language being acquired; it also takes time for a community to get used to a researcher. During the fieldwork I often brought one or two cameras with me, to help the villagers (especially children) relax, behave and, importantly, to sign normally, to the point where they almost disregarded the

cameras. Various stimulus-based elicitation tasks were also conducted. Despite the fact that only a few of the Kata Kolok signers have received formal education, they have a strong impression of what goes on at school. Initially the elicitation tasks were considered scholastic, and participants were not comfortable with this. Interestingly, their initial discomfort disappeared over time as they learnt that the tasks had multiple and equally acceptable solutions. In addition, re-telling video clips based on cartoons actually became an entertaining way of spending the afternoon, especially since the signed descriptions were put on DVD upon request, so that signers could watch them at home.

An overview of the fieldwork trips undertaken as part of this project is presented in Table 3.1. In addition to these visits, my fieldwork assistant, Ketut Kanta, was able to visit the Max Plank Institute in Nijmegen for a month in March 2007 to work on the transcription of the initial data set. The types of data collected are described in more detail in the relevant sections of the thesis.

TIME	ACTIVITIES
July 2006 (3 weeks)	Introduction and forming relationships with village community and local authorities Learning Kata Kolok (ongoing) Arranging permits First trial of the deaf school (for more information about this, and subsequent references, see section 3.2)
December 2006-January 2007 (1 month)	Recording dialogue conversations Recording story retellings (including Die Sendung mit der Maus and Canary Row) Re-initiation of the deaf school
July-October 2007 (3 months)	Pointing ethnography (Wilkins, Kita, and Enfield 2003) Nijmegen Space Games data collection Language of Perception data collection Infant pointing data collection (of hearing Balinese infants see Liszkowski & Brown 2007; Liszkowski et al. 2012) Final establishment of inclusive deaf school in collaboration with local authorities
January-March 2008 (3 months)	Road trip data collection (see p. 267) Analysis of spatial language in spontaneous narratives with fieldwork assistant
July-August 2008	Reciprocal data collection (Evans et al. 2004)

(2 months)	Road trip data analysis
January-February 2009 (6 weeks)	Conclusion of fieldwork

**Table 3.1** Record of time spent at the field site

#### 3.4 *Creation of the Kata Kolok corpus*

At the start of the project, I Gede Marsaja kindly shared his Kata Kolok data, which consists of eleven hours of group conversations. These data were collected by I Gede Marsaja in 2000 and I Gede Marsaja and Waldemar Schwager in 2005. The analyses presented in this thesis are based on the Kata Kolok corpus, which was created during the course of this project and contains almost one hundred hours of archived video data. As such, it is of a similar size to recently created sign language corpora for urban sign languages, such as the corpus of Australian Sign Language (Johnston 2007) and the corpus of Sign Language of the Netherlands (NGT) (Crasborn, Zwitserlood, & Ros 2010).<sup>23</sup> As will be clear in the following sections, however, the Kata Kolok corpus includes different types of data compared to these urban sign language corpora. The particular sociolinguistic setting of Kata Kolok, as well as various hypotheses related to its structure, called for this approach. The current Kata Kolok corpus is archived jointly by the International Institute for Sign Languages and Deaf Studies (iSLanDS) in Preston, UK, and the Max Planck Institute for Psycholinguistics in Nijmegen.<sup>24</sup>

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<sup>23</sup> An overview of existing sign language corpora can be found on <http://www.sign-lang.uni-hamburg.de/dgs-korpus>.

<sup>24</sup> During the course of this project the author was based within the Language & Cognition Group of Prof. Stephen C. Levinson at the Max Planck Institute for Psycholinguistics in Nijmegen, but received external supervision from Prof. Ulrike Zeshan at the International Institute for Sign Languages and Deaf Studies (iSLanDS) at the University of Central Lancashire in Preston, UK. At the start of the project it was decided that the data would be archived in both places for the benefit of both research groups.

#### 3.4.1 Contributors

As described in section 2.4, the Bengkulu signing community has a large section of hearing signers. Some are balanced bimodal bilinguals, that is, equally fluent in both spoken and signed language; others have acquired Kata Kolok later in life, or are non-fluent. All kinds of signers have been included in the current corpus. Since hearing signers show more variation in their sign language than deaf signers, depending on the age at which they acquired sign language, information on their signing history is provided in the metadata files of the corpus, when available.

It is rare for sign language corpora to include hearing signers, since they are not normally native signers, and they might be more influenced by the spoken language. In the case of Kata Kolok, however, deaf signers represent only 4% of Kata Kolok users. Only by including hearing signers can we begin to answer questions on how they might have influenced the structure of Kata Kolok. At present, there are approximately seven hours of recorded conversations between deaf and hearing Kata Kolok signers. Besides deaf monolingual signers and hearing signers of various levels of proficiency, the corpus also contains data from children (aged between one and 14 years old) as well as three deaf teenagers who are bilingual in Kata Kolok and Indonesian Sign Language. These latter types of data have not yet been transcribed, due to time considerations.

#### 3.4.2 Metadata

For each session of Kata Kolok video data a metadata file was produced based on the IMDI format, which is a standardised way of describing multi-media and multi-modal language resources for the purpose of making the data searchable once added to a corpus (Broeder & Wittenburg 2006). The anonymised Kata Kolok metadata can be found at the following URL: <http://corpus1.mpi.nl>, and subsequently navigating to the relevant section by opening the branches: Sign

Language, Sign Language Typology, Village Sign Languages, Bali, Vos, Kata Kolok.

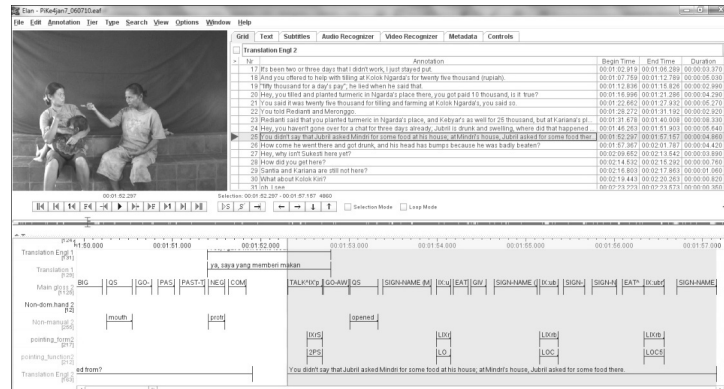
Each metadata file was enriched using a sign language specific profile which was adopted from Crasborn and Hanke (2003). The profile includes information on hearing status, the hearing status of close relatives, age of sign language acquisition, use of hearing aids, and education levels. The deaf population in Bengkulu forms a homogeneous population in terms of these metadata, as all of the deaf signers acquire signing from birth, none of them use hearing aids, and only two adults have had more than a few months of formal education.

#### 3.4.3 Translations, annotations, and coding

The video data were digitised and later stored at the Max Planck Institute for Psycholinguistics in Nijmegen. This initial step ensured the safety of these unique video materials as this digital archive is backed-up at six locations across the Netherlands and Germany (Koenig 2011). A selected portion of the data were translated into Bahasa Indonesia by Ketut Kanta. The Indonesian sentences were then translated into English by Febby Meillisa, who worked at the Jakarta Field Station of the Max Plank Institute for Evolutionary Anthropology. In addition to a high proficiency in English, she has the necessary cultural background to make good translations as she lives with in-laws in Bali. Whenever ambiguities or a lack of clarity occurred in the Indonesian translations, she contacted Ketut Kanta in order to be able to select the correct translation. The translations in Bahasa Indonesia and English make the corpus accessible to a national and international audience. However, for proper linguistic analysis, in-depth annotation and coding is required. These detailed sign-by-sign glosses were produced by the author based on the English translations and knowledge of the language. Whenever necessary, Ketut Kanta was able to provide clarification.

The data were annotated and coded using ELAN annotation software, which is freely available at <http://www.lat-mpi.eu/tools/elan>. ELAN enables the researcher

to make time-aligned video annotations on multiple tiers, which can be created and arranged according to the nature of the research questions. Figure 3.1 shows a screenshot of the programme, where a section of Kata Kolok data have been annotated and coded. The video on the top left is linked to the timeline at the bottom of the image. Several independent tiers have been created to which linguistic annotations are added. Each signer in the video has five basic tiers. Two tiers are dedicated to manual signs: ‘Main Gloss’ is used to annotate two-handed signs and signs produced with a signer’s dominant hand; the tier called ‘Non-dominant hand’ is used to tag signs produced by the signer’s non-dominant hand. A third tier is used to encode non-manual signals including various facial expressions and body movements. The Kata Kolok corpus has two tiers that provide sentence-level translations, one in Bahasa Indonesia and one in English. The ‘Comment’ tier allows for remarks pertaining to signed content or culturally-entrenched information.



**Figure 3.1** ELAN annotation software

For the current project, an annotation protocol was used that was developed by the Sign Language Typology Group at the Max Planck Institute for Psycholinguistics

in Nijmegen. Additional coding was added to account for the forms and functions of pointing signs, the types and uses of classifiers, and constituent order. The data sets and coding protocols used for these coding activities are described in detail in the appropriate sections, as follows: the coding of pointing signs is described in section 13.3; coding of classifiers in section 4.5; constituent order in section 4.9. Finally, the pointing coding protocol is provided in Appendix IV: 'Pointing Coding Scheme'. During the course of this project 4.5 hours of Kata Kolok video data were fully transcribed. It is important to realise that the ratio of transcription to time can be high; one minute of data can take up to two hours to fully transcribe. Therefore, more transcriptions were not possible in the course of this project.

#### 3.4.4 Sub-corpora

The corpus was divided into four themes: spontaneous, elicited, child signing, and deaf-hearing interaction. Each of these sub-corpora, and the data they contain, are described below.

##### *Spontaneous data*

During the collection of spontaneous data from deaf signers the aim was to get a large degree of variety in terms of level of formality and range of topics (Himmelmann 1998). In order to achieve this, a number of different signers were recorded in culturally-informed types of settings. Spontaneous data took the form of three different participant configurations: group conversations, dialogue conversations and monologue narratives.

Group conversations were mostly recorded at the patches of farmland of families with deaf members, with (mostly deaf) signers sitting in a semicircle, eating *lawar* and drinking *tuak*.<sup>25</sup> These data meet the standards for spontaneous interactional data collection as proposed by Enfield, Levinson, de Ruiter, & Stivers

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<sup>25</sup> Lawar is spiced, chopped up food; tuak is locally brewed (white) palm wine.



(2007). That is, conversations in these settings are among the most informal. Signers are friends or close relatives, and interact with each other on a daily basis. The topics discussed range from the price of rice, levels of recent rainfall, and forthcoming ceremonies, to recent serious accidents, local politics, or gossip. All of the 48 deaf signers living in Bengkala at the time of fieldwork appear in these recordings. This data set is of particular relevance to studies of the interactional foundations of language use and language emergence.

For the recording of dialogue conversations, deaf signers were invited to come to my residence in the village. The house where I lived is owned by Ketut Kanta's family, and many of the deaf men helped to build it. It is also close to a compound where many deaf individuals live. In the course of the research project, signers would come to this location almost every evening, and were therefore at ease in this location, although it is a more formal setting than the conversations that took place on their own farm land. Signers were asked to select a conversation partner, and could bring their own (deaf) signing partner if this suited them. This resulted in four male-male interactions, five female-female interactions, and two male-female interactions. The latter involved a brother and sister, and a woman and her brother-in-law. It is particularly difficult to get recordings of mixed-gender interactions outside of family, since there are social restrictions on interaction in Bali in general. 17 deaf signers were involved in these recordings.

Monologue narratives were recorded with one signer in view, and at least one, but usually more behind the camera. Each metadata file indicates the individuals present during the recording session, including the filmer and observers. 11 deaf signers, who enjoy the art of storytelling, contributed to this data set. Recordings were either made in the signer's own house, or at the house where I lived, described above. A subset of narratives was recorded with two cameras, where a second camera was added in order to obtain detailed information of the facial expressions that were used. Signers were able to tell whichever story they wanted,

but they were sometimes prompted by the researcher or research assistant for narratives on certain topics. The narratives include stories about recent terrorist attacks in Bali, local ghost stories, stories about the Dutch colonial period and the Japanese occupation, motorbike accidents, family histories, extinct species of animals, water pipe maintenance, and trips abroad. Table 3.2 gives an overview of the topics covered in the spontaneous data of the Kata Kolok corpus.

TOPIC	GROUP INTERACTION	DYADIC CONVERSATION	MONOLOGUE NARRATIVES
Gossip	X	X	X
Farming	X	X	X
Deaf ghost			X
Bali Bombing		X	X
Balinese/national history			X
Hindu ceremonies	X	X	X
Traffic accidents	X	X	X
Road trips in Bali			X
Travel abroad			X
Family history			X
Occupation	X	X	X
Weather	X	X	X
Education	X	X	
Politics	X	X	

**Table 3.2** Topics covered in spontaneous data in Kata Kolok corpus

#### *Stimulus-based Elicited data*

In addition to spontaneous signing, data were also elicited using standardised stimulus materials aimed at various linguistic domains. In the summer of 2007, I recorded descriptions of a stimulus-set designed specifically to elicit perception terms, such as colours, smells, and tastes. The stimulus set was created at the Max Planck Institute in Nijmegen for the Language of Perception project (Majid & Levinson 2007). The same set of materials was used in over a dozen field sites,

including two additional sign languages: American Sign Language (by Karen Emmorey, Cindy Batch, and Brenda Nicodemus) and British Sign Language (by Neil Fox, Adam Schembri, and Bencie Woll). Data analyses are ongoing, but an initial publication on Kata Kolok colour terms reveals differences between the systems of spoken Balinese and Kata Kolok (de Vos 2011).

For the current project, I filmed five dyads conducting an adjusted version of the Man and Tree task, which is described in detail in chapter 11. Asli Özyürek, Pamela Perniss, and Inge Zwitterlood also kindly provided me with a kit they assembled for a research project on the role of modality in shaping sign language structure in the domain of space in particular.<sup>26</sup> This kit contained a variety of materials that can be used to elicit spatial forms, including for example describing spatially-arranged objects, and ‘giving and taking’ events. Motivated by preliminary observations of potential directional constructions in these elicited data, a pilot was run based on the Reciprocal Constructions stimulus set (Evans et al. 2004). This data collection successfully elicited various directional constructions that I intended to elicit, but the data have not yet been analysed in full due to time constraints. Finally, one episode of *Canary Row*, better known as the *Tweety and Sylvester* cartoon, was shown to 12 signers individually, in eight segments, and they were asked to retell the story after each viewing. These recordings are particularly suited for cross-linguistic comparison because many sign language and gesture studies are based on the same stimulus set. Video clips from *Die Sendung mit der Maus* were retold by the same signers (see Perniss 2007:261-8 for a detailed description of the *Maus* videos). Both stimulus sets are commonly used in the field of sign linguistics. It is therefore hoped that these data could in future lead to comparison with other sign languages.

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26 The project is called "Relations between modality and language structure: Insights from comparisons of sign languages and gestures" and is funded by the Dutch Science Foundation (NWO).

Table 3.3 presents an overview of the stimulus-elicited Kata Kolok data that were collected during the course of this project.

STIMULUS MATERIALS	NUMBER OF SIGNERS RECORDED	ORIGIN / SOURCE OF MATERIALS
Man and Tree game	10	adapted from Pederson et al. 1998
Language of Perception	13	Majid & Levinson 2007
Reciprocals	4	Evans, Levinson, Enfield, Gaby, & Majid 2004
Space and Number	14	Özyürek, Zwitserlood, & Perniss 2010
Die Sendung mit der Maus	13	Perniss 2007:261-8
Canary Row	12	From the stimulus archive of the Max Planck Institute for Psycholinguistics

**Table 3.3** Stimulus-based elicited data in Kata Kolok Corpus

#### *Child signing*

In Bengkulu, deaf children grow up in a linguistic setting quite similar to hearing children, in terms of acquiring language naturally from birth. Usually their parents can sign, in addition to most of their neighbours, and the children they play with (see section 2.4). Furthermore, preliminary observations of Kata Kolok have revealed the existence of a special register for child-directed signing (see also Nonaka 2004 on child-directed signing in Ban Khor Sign Language). At the start of the project there were no existing studies of first language acquisition in such a uniquely rich signing environment, and it was therefore decided to include longitudinal child signing data in the Kata Kolok Corpus.<sup>27</sup> From mid-2006 until

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<sup>27</sup> The creation of the Kata Kolok Child Signing corpus has since led to a pilot study capturing the coordination of manual and non-manual components of perfective aspect in child signing (de Vos forthcoming).

mid-2009, recordings were made of two deaf children born into deaf families, who were aged 1;11 and 2;0 at the time of the first recording.<sup>28</sup> Recordings were made once or twice a month in systematically varied situations: interacting with a parent or caregiver, interacting with each other or with other deaf and hearing children, and in free play. Each recording session lasted at least half an hour. In a later phase of the project, two hearing babies were born into deaf families. Infant-adult interactions between these children and their mothers were recorded in their homes. In contrast to the other recordings in the project, all child signing recordings were made by the research assistant, Ketut Kanta. Ketut Kanta has lived in the village all his life, is a fluent Kata Kolok signer, has known the deaf families in the village for many years and has worked with them on several occasions. Consequently, he is a familiar face for the participants of the child signing sub-project, and thus particularly suited to make the recordings. Ideally, close relatives would have made recordings of the children, but this was not possible because of their limited technological knowledge.

Table 3.4 gives an overview of the longitudinal child signing data. All of the parents of these children were deaf and fluent sign language users.

DETAILS OF THE CHILD	AGE DURING THE RECORDINGS	NO. OF RECORDINGS
A: deaf, male	2;0 – 4;2	29
B: deaf, female	1;11 – 3;9	39
C: hearing, female	0;9 – 1;5	5
D: hearing, male	0;2 – 1;10	11

**Table 3.4** Longitudinal child signing data in the Kata Kolok corpus

The hearing girl was growing up in a multilingual setting, with Kata Kolok and the variety of Indonesian Sign Language used in Singaraja. Her deaf great-aunt and

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28 The number before the semi-colon is used to indicate the age of the child in years; the number after the semi-colon indicates the number of months.

deaf mother (both married to her father) use Kata Kolok; her deaf father uses a variety of Indonesian Sign Language, and her deaf brother is fluent in both sign languages.<sup>29</sup>

In addition to the longitudinal child signing data, the corpus contains two different data sets included in the child signing sub-corpus. First of all, spontaneous interaction and play between deaf and, sometimes, hearing children was collected. This data set contains signing from seven deaf children of various ages (five-14) who are all fluent signers. Secondly, recordings were made in the local deaf school, which was established as part of a subsidiary project.

#### *Deaf-hearing interaction*

Sign linguists have traditionally chosen to focus on deaf native signers as their main informants, and there are good reasons for this. Most importantly, age of acquisition is known to influence proficiency (see for instance Lillo-Martin 2000; MacSweeney et al. 2008). Such acquisition effects have been argued to play a role in the distinct constituent orders used by deaf and hearing signers of Providence Island Sign Language (Washabaugh 1979). In Kata Kolok, a different register appears to be used among deaf (and a few very fluent hearing) signers, as opposed to the signing used when communicating with hearing villagers. Marsaja notes that:

“The way Kata Kolok is used amongst the kolok and during any kolok gatherings or performances is also culturally distinct in terms of fluency and the use of special jargon, when compared to its normal use in everyday communication with hearing people.”

Marsaja 2008:78

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29 Very little is known about this and other types of sign multilingualism, but an ERC funded project began in March 2011 headed by Prof. Ulrike Zeshan at the iSLanDS Institute in Preston, UK.

Given Marsaja's observation, and the possibility that hearing signers may exhibit distinct linguistic patterns, this project focuses on describing the signing used by deaf Kata Kolok signers amongst themselves. This initial step in the description of the language will also ensure comparability to sign language structures as they are described for urban sign languages, as these studies have also aimed to elicit data from deaf, native, fluent signers. Comparisons will reveal genuine cross-linguistic variation, since structural differences will not be attributable to the hearing status or fluency of signers.

In addition to including data of deaf native signers, the Kata Kolok corpus also includes a systematically-generated collection of data from hearing signers and non-fluent signers. This innovation has been motivated by both demographic and linguistic arguments laid out in section 2.4 in particular. First of all, the vast majority of Kata Kolok signers are hearing, and more than half of all Kata Kolok users are non-fluent in the language. For these reasons, the patterns of signing found among Kata Kolok hearing signers may make a valuable contribution to future understanding of the structures that have emerged in Kata Kolok.

### *3.5 Summary and discussion*

This chapter has shown how previous knowledge of the Kata Kolok signing community, as described by Marsaja (2008), has informed the composition of the Kata Kolok corpus. The corpus contains a large amount of data from deaf native signers, and this forms the basis for linguistic descriptions throughout the thesis. In addition, several stimulus materials, which have been used to elicit linguistic data from other (sign) languages were used to elicit Kata Kolok data too. These methodological decisions ensure maximal comparability to other (sign) languages. Although the corpus is comparable in size to the corpora of other sign languages, it has a different composition. In contrast to urban sign language corpora, which include data only from deaf, native signers, the Kata Kolok corpus also includes

data from hearing signers, both fluent and non-fluent. Additionally, a special section of the digital archive has been devoted to first language acquisition.

There are two final points regarding the future functionality of the Kata Kolok corpus. First, it is hoped that the Kata Kolok corpus can serve as an example for the documentation of other village sign languages that display similar sociolinguistic properties. Secondly, although the data have been processed and archived digitally, along with at least minimal metadata, a large part of the corpus is not yet optimally accessible. Only a small percentage of video data (4.5%) have been transcribed fully. Furthermore, some sections of the corpus require richer metadata. This is especially the case for the sub-corpus on child signing, as a child's expression may not always be fully appreciated without complete access to the signing context.<sup>30</sup> There is also a factor of urgency here, as people's memories of the discussed events fade. The Kata Kolok corpus is searchable with respect to linguistic categories, but researchers from related fields may also find the data to be of interest. These fields may include social interaction studies, religious studies, deaf studies, and studies related to the evolution of language. In other words, it is hoped that, with future investment, the corpus will fulfil its potential as a tool for various research strands.

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<sup>30</sup> Starting from autumn 2011, the Endangered Languages Documentation Programme (ELDP), part of the Hans Rausing Endangered Languages Project (HRELP), has supported the creation of detailed metadata as well as further documentation activities under grant SG0140 "Longitudinal Documentation of Sign Language Acquisition in a Deaf Village in Bali".



## ***4 Structural aspects of Kata Kolok***

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### *4.1 Overview*

Chapter 4 provides examples of key structures, specific to this sign language, that play a central role in this thesis. Some of the most remarkable features of Kata Kolok grammar from various linguistic perspectives - such as linguistic typology, language contact, language emergence, and sign language typology - are presented. Section 4.2 presents an overview of the manual and non-manual forms that feature in Kata Kolok, and how these are represented in sign language transcriptions. Sections 4.3 and 4.9 report the striking differences between the lexica and constituent orders of Kata Kolok and Balinese. Sections 4.4 and 4.5 present a comprehensive overview of some of Kata Kolok's complex morphology: paradigms of numeral incorporation and classifiers. Section 4.6 describes intensification, which is a morphological process that enhances the magnitude of predicates. Kata Kolok has three aspectual markers: completive aspect, negative completive aspect, and distributive aspect (section 4.7). Section 4.8 discloses that, unlike other sign languages, Kata Kolok does not have a separate class of agreement verbs. Finally, section 4.10 summarises Kata Kolok's most salient features.

### *4.2 Manual and non-manual forms*

Many introductions to sign linguistics begin with the citation of Stokoe's (1960) study arguing that phonological parameters in American Sign Language are equivalent to spoken language phonemes. Stokoe's study is one of the founding papers showing that sign languages display linguistic structures that are in all domains fundamental to human languages. In particular, Stokoe convincingly argued for a true phonology of sign languages. The term phonology might seem out of place in the context of sign language, but it refers to the sublexical level of

meaningless forms that make meaningful signs. In fact, Stokoe himself used the less paradoxical terms “cheremes” and “cherology” - after the ancient Greek word for 'hand' (χειρ) - but these terms were less enduring than his theoretical claims.

The gist of Stokoe’s argument is that the gestural forms of sign languages are not holistic, unanalyzable images, but can be deconstructed on the basis of three parameters: the type of articulator, the place of articulation and the type of movement. In later descriptions of American Sign Language, hand orientation was added to this list of fundamental parameters of signs (Stokoe, Casterline, & Croneberg 1965). Crucially, sign parameters can form minimal oppositional pairs of signs in which a difference in one of the parameters renders a unique, non-compositional change in meaning. Such pairs of signs or words are referred to in phonology as minimal pairs and provide conclusive evidence for the phonemic status of sounds or, in the case of sign languages, parameters. Sign parameters thus indicate that sign languages and spoken languages alike form meaningful “words” from meaningless components. This is called duality of patterning - one of the design features of language (Hockett 1960).

It has proven extremely difficult to find minimal pairs in Kata Kolok. Figure 4.1 shows the closest example to a minimal pair in Kata Kolok. Here the parameter orientation minimally distinguishes between the signs TOURIST (panel A) and ELEPHANT (panel B). Both signs have the same handshape and place of articulation, and neither signs have internal movement. They differ solely with respect to the parameter of orientation: TOURIST is made with a neutral palm orientation and ELEPHANT with the palm oriented downward. The difference between this near-minimal pair of signs and a true minimal pair is that the meaning of these signs is transparent and compositional, as the sign for TOURIST indicates the shape of the average Caucasian nose, and the sign for ELEPHANT indicates the form of the elephant’s trunk.



**Figure 4.1** A near-minimal pair in Kata Kolok based on the orientation parameter  
(TOURIST (panel A) versus ELEPHANT (panel B))

The finding that Kata Kolok might not have real minimal pairs is particularly intriguing as they have not been attested in the second generation of Al-Sayyed Bedouin Sign Language users either (Aronoff et al. 2008). However, Al-Sayyed Bedouin Sign Language appears to be developing phonological categories in its third generation (Sandler et al. forthcoming). Nyst (2007a:80) reports seven phonemic handshapes in her description of Adamorobe Sign Language, and following van der Kooij (2002) she excludes motivated handshapes from further analysis. Marsaja (2008) has already presented a detailed analysis of Kata Kolok's formational building blocks. His main observations on movement types, places of articulation, and types of orientation are confirmed here. The sections below present an overview of the handshapes in Kata Kolok, which are essential to describing the examples throughout this thesis, but leaving their phonemic status unresolved.

#### 4.2.1 Handshapes

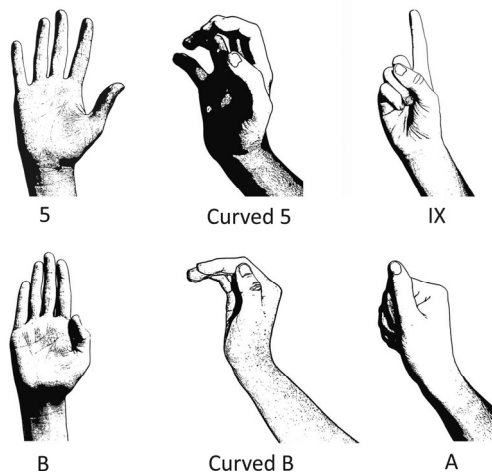
Marsaja (2008) does not distinguish between phonemic and phonetic handshapes and groups Kata Kolok's handshape inventory into three categories: basic, regular, and restricted handshapes. Marsaja (2008:134) describes basic handshapes in the following way: they are simple and easy to configure naturally, they are productive in the sense that they have the potential to be used in a large number of signs in the sign language, and they are easier to recognise compared with other handshapes. Regular handshapes are used in a more limited range of signs but are nevertheless frequent. Restricted handshapes are defined by the fact that each handshape represents a unique morpheme and can therefore only be used in a single sign or as a compound.

The present analysis adopts Marsaja's (2008) handshape categories. There are, however, three points at which the current analysis differs from Marsaja's view. First of all, I suggest here that a distinction between the loose fist and the tight fist cannot be confirmed, and consequently both handshapes are included in the S-hand category. Secondly, two additional basic handshapes have been attested in the Kata Kolok data set: the loose 5 hand (see Figure 4.4 on p. 82) and the thumb-IX-pinky hand (Figure 4.5, on p. 83). Finally, it was found that the bunched hand is not used restrictively and should therefore be considered a regular handshape.

In Figure 4.2 the six basic handshapes of Kata Kolok are illustrated: the 5-hand, the B-hand, the curved 5, curved B, the A-hand and IX.<sup>31</sup> Note that the A-hand and B-hand refer to the handshapes commonly used for the initial letters of the alphabet in American Sign Language. 'IX' refers to the initial and final letter of 'index' in index finger. The labels for these handshapes were chosen mnemonically.

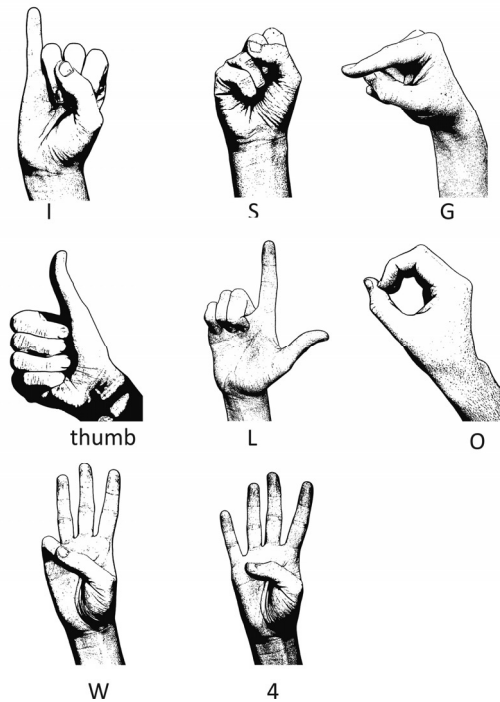
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31 I would like to thank Tilman Harpe for producing Figure 4.2-4.5.



**Figure 4.2** Basic handshapes used in Kata Kolok Signs

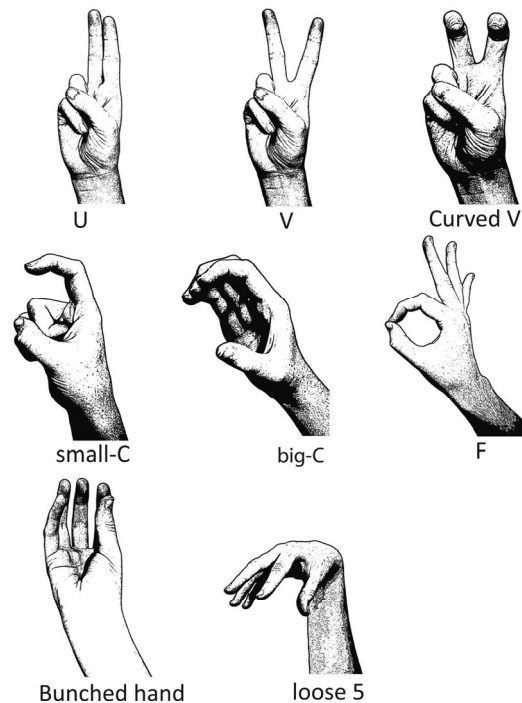
Marsaja (2008) identifies 16 regular handshapes in Kata Kolok. The regular handshapes consist of two sets. The first set concerns handshapes that have relatively stable forms and for which the typical form is relatively easy to identify. These stable regular handshapes are illustrated by Figure 4.3. They include the I-hand, S-hand, and G-hand, the thumb, the L-hand, the O-hand, W-hand, and 4 handshape.



**Figure 4.3** Regular handshapes (set 1)

In addition to this set of stable regular handshapes, Kata Kolok also has regular handshapes that may be part of a derivation pattern and for which it is unknown where potential phonemic category boundaries lie. These handshapes are depicted in Figure 4.4. They include the following handshapes: the U-hand, V-hand, and curved V handshape, the small C-hand, big C-hand and F-hand, the bunched hand, and the loose 5-handshape. It is unclear at present whether these handshapes are independent phonemes. For instance, the difference between the V-hand and curved V-hand does not identify a minimal pair in Kata Kolok. That is, the difference between these handshapes may represent a gradient phenomenon in which a

change in the shape of the hand does not render the sign ill-formed or ungrammatical. Rather, the change in handshape may provide an iconic description of the referent, by virtue of the degree of flexion of the selected fingers. Similarly, the big C-hand and F-hand also have an intermediate form (not in the figure) that has the index finger and thumb positioned like in the big C-hand, yet also the middle finger, ring finger, and little finger extended like in the F-hand. All three forms occur particularly frequently when signers trace the outline of shapes.<sup>32</sup>

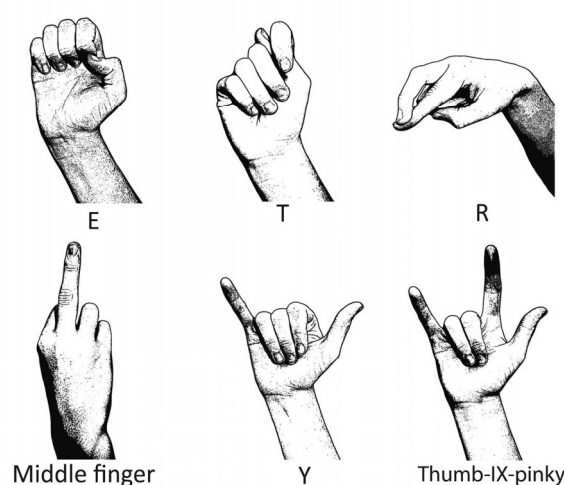


**Figure 4.4** Regular handshapes (set 2)

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<sup>32</sup> They occur in a sign language-specific structure known as Size and Shape Specifiers (SASS) (Supalla 1986).

Finally, Marsaja (2008:137) identifies a set of restricted handshapes. Restricted handshapes are defined by the fact that they can only be used in a single morpheme. The exhaustive list of restricted handshapes features: the E-hand, the T-hand, the R-hand, the middle finger, the Y-hand and the thumb-IX-pinky-hand. Images of these handshapes are presented in Figure 4.5.



**Figure 4.5** Restricted handshapes

Strikingly, half of the restricted handshapes have offensive meanings in Kata Kolok: the E-hand, the T-hand, and the middle finger. Two of these are also used as emblems by the wider Balinese culture: the E-hand is used in the Kata Kolok sign and the Balinese emblem ‘to swear,’ while the T-hand is used to refer to a sexual affair. Another offensive handshape is the middle finger, which might have been adopted from Australian Sign Language (see Marsaja 2008:137).<sup>33</sup> Marsaja

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<sup>33</sup> Two deaf members of the Tihing/Pulasari clan have visited Australia, and one of them still lives in Australia after a marriage to an Australian deaf woman. As this signer returns



(2008) does not report on the thumb-IX-pinky handshape. Like the Y-hand, the thumb-IX-pinky handshape is only used to refer to aeroplanes. There is in fact a lot of variation in the handshapes used to refer to aeroplanes which also includes the B hand. The thumb-IX-pinky is not used in other signs in the language and is generally not used in Balinese co-speech gestures. It is therefore unlikely that the thumb-IX-pinky-hand is a loan from Balinese co-speech gestures. This handshape might however have its origin in signs from Indonesian Sign Language, Australian Sign Language or perhaps from visiting signers from yet other parts of the world. Finally, the R-handshape holds a special status: although it refers to the female genitalia it is not normally considered offensive in Kata Kolok and is generally used to refer to women, neutrally. In general Balinese culture, the handshape can however be directed at men, with the intention of insulting them. Hence, all of the restrictive handshapes seem to show some kind of overlap with an emblematic use within the wider hearing community and may therefore stem from co-speech gesture.

From these six handshapes the R-hand stands out in that it can be used to form compounds, e.g. LESBIAN-LOVE. This latter observation is an indication that the morpheme has become integrated within the linguistic structure of the language. Notwithstanding the fact that it functions as a morpheme, there is no clear-cut evidence that it has a phonemic status, as it is not a valid handshape in other signs and cannot attain any other meaning. In other words, it is not a meaningless form. This latter argument holds for restrictive handshapes per definition and for this reason they do not seem to function as true phonemes within the language in the way that other handshapes do.

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to Bengkulu every two years, it is likely that he has introduced this sign into the community.

#### 4.2.2 Non-manual signals

Signed communication is conveyed, not only by the hands, but also by the use of so-called non-manual signals. These non-manual markers include the use of facial expressions (including mouth movements), head movements, and shifts of the torso (including body leans and shoulder shifts). The use of non-manual signals in signed communication is often compared to prosodic use of intonation in spoken languages (Sandler 1999).<sup>34</sup> Likewise, non-manual signals are used at every level of communication including linguistic domains such as grammar and pragmatics, and paralinguistic functions such as the expression of affect. On a par with the research on spoken language intonation, the distinction between linguistic and paralinguistic non-manual signals in sign languages is not always clear-cut (Baker-Shenk 1983:267), and in some cases they may interact (Baker-Shenk 1986; van der Kooij, Crasborn, & Emmerik 2006; de Vos, van der Kooij, & Crasborn 2009). This thesis does not focus on the use of non-manual signals in Kata Kolok, but they inevitably surface in subsequent sections since they are as pervasive in Kata Kolok as they are in other sign languages (see for example sections 4.6 and 4.7).

#### 4.2.3 Sign language glosses

Signers have their hands, their bodies, and facial expressions available for articulation and this essentially multi-channelled nature of sign languages calls for representations that reflect simultaneity as well as linearity. The signed examples presented throughout this thesis achieve this by describing the signed information on three simultaneously unfolding levels: the signs produced by either the dominant hand (or by both hands, in case the lexical form is bimanual), the signs produced by the non-dominant hand, and non-manual markers. These three levels

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34 Speakers may also make extensive use of ‘non-manual signals’ during conversations, but the relationship between the use of these types of visual signals in signed versus spoken communication is as yet unclear (Ekman 1979; Enfield 2009).

are represented by lines marked as Main gloss (MG), Non-dominant hand (ND), and Non-manual (NM) respectively.

Example 4.1 below serves to familiarise readers with this type of representation. The sentences below start with IX, which represent a pointing sign produced with the index finger. This is followed by the gloss OFFSPRING, which is produced by the signer's dominant hand. Importantly, the meaning of the sign which is glossed as OFFSPRING does not necessarily match the meaning of the English word exactly. The Kata Kolok form which is consistently glossed as OFFSPRING may, for instance, in other contexts, mean 'give birth to'. The primary function of sign language glosses is thus to lemmatise a corpus, rather than to present accurate translations. Each individual form receives a different gloss presented in capitalised letters, and the contextualised translations of the signed sentences are provided between single quotes below the glosses. I have used bold case to draw attention towards relevant items as in the gloss INFANT below. Additionally, most examples are accompanied by a drawing of a still image from the video file as in the case of Still 4.1. The location of the frame in the video file from which these stills stem is indicated in the arrows above the Non-Manual (NM) line. Example 4.1 is discussed in more detail on p. 106.



**Still 4.1** The initial and final frame of the handle classifier used to indicate "carrying a body" in Kata Kolok

#### Example 4.1 Glossing conventions

↓ Still 4.1 ↓

NM		<u>bite</u>	
MG	IX OFFSPRING IX	GRAB	Handle CL:S'carry person' EAT
ND			Entity CL:B'child'

'If there was a young child, it would be abducted and eaten by the ghost.'

NM			
MG	INFANT	EAT	DIE
ND		Entity CL:B'child'	

'It (the ghost) would eat the infant and it would die.'

Gta6oct7\_handleclassifier\_S.mpg

In the example above, the signer produces the lexical sign GRAB simultaneously with a non-manual 'bite', and the vertical alignment of these elements reflects the timing of these forms. Non-manual markers are provided in small letters, and sometimes abbreviated. Appendix II provides a list of non-manual markers used to transcribe the Kata Kolok corpus and the signed examples in this thesis. Finally, bimanual constructions are indicated by the vertical alignment of signs in the MG and ND tiers. In the example above the signer produces the lexical sign EAT simultaneously with the Entity Classifier (Entity CL) representing the child that is being eaten.<sup>35</sup> The letter, directly following the colon, indicates the handshape that is used in this particular classifier. The information that follows between the single quotes is not encoded in the form itself, but provides additional clues to the reader about the meaning of this sign. Most signed examples in this thesis are accompanied by video files that allow readers to review the signed utterances themselves. The initial parts of the file names refer to the entire video file as it was

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<sup>35</sup> See section 4.5.1 for more information about entity classifiers.

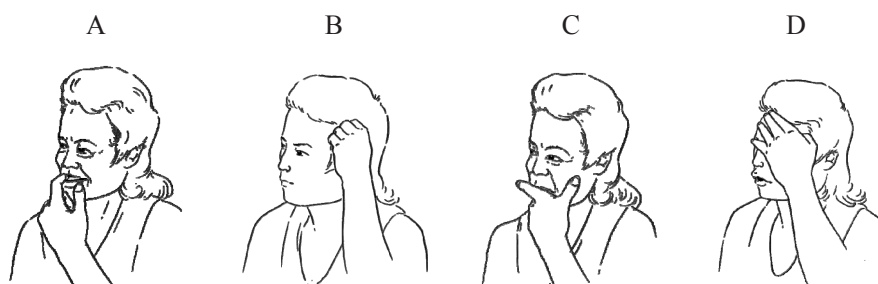
added to the Kata Kolok corpus. The video file described in Example 4.1 is called “Gta6oct7\_handleclassifier\_S.mpg,” and this means that the example was selected from the larger file called Gta6oct7. The reader can thus consult metadata on that file by viewing the corpus online (as described on p. 64). The video files will be made available via the website of the Max Planck Institute for Psycholinguistics ([www.mpi.nl](http://www.mpi.nl)).

#### *4.3 The lexicon*

Material culture is often seen as one of the driving forces behind colour term lexicalisation (Levinson 2000a). The Pirahã tribe’s lack of lexical numbers has been linked to the absence of a cultural need for counting within this community (Everett 2005). The Kata Kolok community presents a unique perspective on this issue, as its deaf signers share their culture with the wider hearing Balinese community, yet deaf and hearing villagers communicate in two autonomous languages. Kata Kolok has an extensive counting system, but the sections below show that the language has only a small number of lexicalised colour signs and kinship terms compared to spoken Balinese. The divergence between the linguistic systems of Kata Kolok and Balinese shows clearly that it is possible to share a culture that includes two radically different languages, one of which has fewer lexical items and less restrictive categories in a particular semantic domain (section 4.3.1). Furthermore, certain contact-induced structures that occur in urban sign language lexica are not attested in Kata Kolok (section 4.3.2). The similarities between Kata Kolok and other village sign languages, described in section 4.3.3, support the idea that social factors may play a role in the formation of a signed lexicon.

#### 4.3.1 Differential lexicalisation in Kata Kolok and Balinese

For the elicitation of colour terms, a standardised stimulus comprising of 80 colour chips from the Munsell colour chart (see Majid and Levinson 2007) was used, to elicit video-recorded responses from 8 deaf signers. The results from this study show that Kata Kolok has four terms to describe colours: ‘white,’ ‘black,’ ‘red,’ and ‘grue,’ i.e. a term covering both English blue and green colours. The sign WHITE is made by pointing at the teeth, and can also be taken to mean ‘teeth’, or ‘white palm wine’ (*tuak*) depending on sentential context. The sign BLACK is made by briefly rubbing a fraction of the hair between thumb and index finger. The sign can also refer to hair. As with the sign for ‘white/teeth/tuak,’ the meaning of ‘black/hair’ is dependent on the context of the utterance. RED is formed by slowly stroking the index finger across the lips. It cannot refer to lips, but the meaning is often extended to refer to the (red) 100,000 rupiah note. All three signs are iconic in the sense that their forms share some quality in common with their meanings. The sign GRUE, made by sweeping the hand across the forehead, is somewhat different, as signers do not attribute an iconic origin to the sign. Moreover, it is the only sign exclusively used for colour descriptions. The four colour signs are illustrated by stills in Figure 4.6.



**Figure 4.6** Kata Kolok has four colour terms  
(WHITE (panel A), BLACK (panel B), RED (panel C), and GRUE (panel D))

The four colour signs form non-contiguous categories and do not exhaust all colours in the spectrum. Or to put it another way: there are lexical gaps. Kata Kolok can thus be classified as a non-partitioning language (Kay & Maffi 1999:746). Kata Kolok signers use non-lexical strategies to indicate these colours by either naming various objects that typically have such a colour, e.g. *banana* to indicate a yellow colour, or by pointing at objects in the vicinity to indicate a colour. The structural differences between lexical and non-lexical colour indications are discussed further in sections 4.6.1 and 14.5 of the thesis, and in de Vos (2011).

The Balinese colour terms are *selem* ‘black,’ *putih* ‘white,’ *barak/bang* ‘red,’ *kuning* ‘yellow,’ *pelung* ‘blue,’ *gadang* ‘green,’ *ungu* ‘purple,’ *soklat* ‘brown, chocolate colour,’ *brumbun* ‘multicoloured,’ *kelawu* ‘grey,’ and *orenz* ‘orange’ (Shadeg 2007).<sup>36</sup> Little is known about the actual use of these spoken Balinese colour terms and for this reason it is not possible to determine whether they are all basic colour terms as defined by Kay (1975). Apart from the size of the colour lexicon, it should be noted that, in contrast to Kata Kolok, spoken Balinese divides blue and green into separate categories. All in all, it is highly unlikely that either spoken Balinese or Balinese culture is a direct source for the Kata Kolok colour term system.

Analysis of the corpus reveals that Kata Kolok has limited kinship terminology, too. An exhaustive list of kinship terms is presented in Table 4.1 (on p. 91). The language has four lineal kinship terms: GRANDPARENT, MOTHER, FATHER, and OFFSPRING. The sign OFFSPRING can refer to any of the following: ‘a child,’ ‘to give birth,’ ‘to be born,’ and, when discussing finance, ‘interest’. Kata Kolok uses the general sign SAME to indicate non-lineal relatives including

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36 I would like to thank Made Hery Santosa for his advice concerning the Balinese terms.

sibling and cousins. Older and younger siblings are sometimes indicated by using the lexical signs HIGH and LOW. Furthermore, the signs SAME, HIGH, and LOW are not restricted to kin relations; as their glosses suggest, their primary meanings are broad and it is only through contextual implication that they are interpreted as kinship terms. Finally, there are lexical items referring to ‘spouse’, ‘polygamous marriage’, and ‘in-laws’. Unlike all other signs, the lexical signs GRANDPARENT and OFFSPRING can be followed by the sign FEMALE or MALE to indicate the gender of the person.

SIGN	RELATIONSHIP
GRANDPARENT	‘grandparent’
MOTHER	‘mother’
FATHER	‘father’
OFFSPRING	‘child,’ ‘to be born,’ ‘to give birth,’ ‘interest’
SAME	‘same/similar,’ ‘sibling,’ ‘cousin,’ ‘consanguineous family member,’ ‘clan member’
HIGH	‘high,’ ‘big,’ ‘older sibling’
LOW	‘low,’ ‘small,’ ‘younger sibling’
MARRIAGE	‘marriage,’ ‘to marry,’ ‘spouse’
POLYGAMOUS-MARRIAGE	‘polygamous marriage’
IN-LAW	‘in-laws,’ ‘(distant) relatives’

**Table 4.1** Kinship terminology in Kata Kolok (exhaustive list)

In comparison to the Kata Kolok system, Balinese kinship terminology is more extensive. Table 4.2 presents an overview of the lineal kinship terms in Basa Biasa (low Balinese) and Bali Halus (high Balinese). In Kata Kolok, only the signs MOTHER and FATHER mark gender. The Balinese system has additional gendered terms for ‘grandmother’ and ‘grandfather,’ for ‘older brother’ and ‘older sister,’ for ‘aunt’ and ‘uncle,’ and ‘male cousin’ and ‘female cousin’. Furthermore, Kata Kolok does not have a conventionalised way of referring to parents. Basa Biasa features a loan from spoken Indonesian: *orang tuane*, while Bali Halus deploys a coordinated structure: *biang lan aji*. In Basa Biasa, the term *pianak* is



used to refer to one's own children, while the term *panak* is used to refer to other children.

RELATIONSHIP	BASA BIASA	BALI HALUS
'father'	Bape	Aai
'mother'	Meme	Biang
'parents'	Orang tuane	Biang lan aji
'son'	P(i)anak muani	Oka lanang
'daughter'	P(i)anak luh	Oka istri
'grandfather'	Kaki	Pekak
'grandmother'	Dadong	Niang
'grandchild'	Cucu	Putu

**Table 4.2** Balinese kinship terminology: Lineal relatives

Table 4.3 presents the full set of collateral terms in Basa Biasa (low Balinese) and Bali Halus (high Balinese). The Kata Kolok sign SAME is used for any blood relative of the same generation including cousins and siblings, while Balinese has separate terms for 'older brother,' and 'older sister,' and 'younger sibling'. Basa Biasa also has a separate term for 'nephews/nieces', but Bali Halus uses the same compounds as for 'son' and 'daughter'.

RELATIONSHIP	BASA BIASA	BALI HALUS
'sibling'	Mekejang	Samian
'brother'	Nyama muani	Semeton istri
'sister'	Nyama luh	Semeton lanang
'older brother'	B(e)li muani	Raka lanang
'older sister'	Mbok luh	Raka istri
'younger brother'	Adi muani	Ari lanang
'younger sister'	Adi luh	Ari istri
'uncle'	Rerame	Rerame
'aunt'	Tumin, We	Bibi
'cousin'	Misan	Mingsiki
'nephew'	Keponakan muani	Oka lanang
'niece'	Keponakan luh	Oka istri

**Table 4.3** Balinese kinship terminology: Collateral relatives

Table 4.4 presents the terms used for kinship relations formed through marriage: affinal relatives. As shown in Table 4.1, Kata Kolok has a non-gendered term referring to ‘a spouse’, and so do Basa Biasa and Bali Halus. Basa Biasa has a designated term for ‘parent in law’ which can form a compound to indicate the gender. Bali Halus adopts identical terms for ‘parents’ and ‘parents in law’. *Mantu*, the expression used to refer to ‘children in law’ is used in both varieties of Balinese. Finally, both high and low Balinese have unique terms to refer to ‘siblings in law’.

RELATIONSHIP	BASA BIASA	BALI HALUS
‘spouse’	Kurenan	Rabi
‘father in law’	Matua muani	Aji lanang
‘mother in law’	Matua luh	Biang istri
‘son in law’	Mantu muani	Mantu lanang
‘daughter in law’	Mantu luh	Mantu istri
‘brother in law’	Ipah muani	Ipen lanang
‘sister in law’	Ipah luh	Ipen istri

**Table 4.4** Balinese kinship terminology: Affinal relatives

Kata Kolok’s kinship system features fewer and more general terms compared to the spoken Balinese forms. These differences provide additional evidence for the observation that spoken Balinese and the Balinese culture have had a restricted impact on Kata Kolok in core lexical domains. A similar contrast has also been attested among hearing communities that adopt multiple spoken languages. The Dyirbal of North Queensland, for instance, use Dyalhuy ‘mother-in-law language’ among taboo relatives in addition to Guwal ‘everyday language’. The former spoken language lists a quarter of the total lexicon of latter (Dixon 1971).

#### 4.3.2 Limited contact-induced structures

Finger spelling is a system that spells out each of the letters of a written word by use of corresponding handshapes. Many sign languages make extensive use of such

a manual alphabet, but only one village sign language to date, Grand Cayman Sign Language, has been reported to have naturally developed a system of finger spelling (Washabaugh 1981). Historically, Kata Kolok did not have a manual alphabet, but with the establishment of inclusive deaf education in 2007, the international manual alphabet was introduced in the classroom. The youngest generation of Kata Kolok signers, both deaf and hearing children are thus starting to use finger spelling, but older generation signers do not use it. These older signers are nonetheless aware of finger spelling as something that Indonesian Sign Language users may use to communicate. Some urban sign languages use “initialisation”, i.e. a signer produces the handshape for the first letter of a spoken word, with an added movement, and a mouth movement that matches the spoken word, to indicate that concept. As Kata Kolok does not have an indigenous finger spelling system, initialisation is not used either. Another contact-induced phenomenon that is prevalent across sign languages is the use of “mouthings,” i.e. mimicking a spoken word by making the same or a similar mouth movement. Mouthings can have various functions not only on a lexical level, but on the supra-segmental level, too, and the prosodic features of mouthings may vary across sign languages (Boyes Braem & Sutton-Spence 2001; Crasborn et al. 2008). In Kata Kolok, there is no systematic use of mouthings, but in Adamorobe Sign Language this type of influence from spoken Akan has been attested (Nyst 2007a:202). Although Kata Kolok does not have mouthings, mouth movements play an important role in the language (see for instance sections 4.6, 4.7.1, and 4.7.2). The origin of these mouth movements cannot be traced back to spoken Balinese words, however. Such types of mouth movements are prevalent in other sign languages, and are commonly called *mouth gestures*.

#### 4.3.3 The lexica of Kata Kolok and other village sign languages

Interestingly, the limited degree of lexicalisation in Kata Kolok is paralleled by reports from other village sign languages in both lexical domains: colour and

kinship terms. With respect to colour, Adamorobe Sign Language (Nyst 2007a:93), Al-Sayyed Bedouin Sign Language (Wendy Sandler, p.c.), Ban Khor Sign Language (Nonaka 2004) and Providence Island Sign Language (Woodward 1989) all have three colour terms: 'white,' 'black,' and 'red'. Furthermore, all these village sign languages have been reported to point for colour when no lexical sign is available, but this has not been reported for any urban sign language. The conventions of colour pointing in Kata Kolok are described in more detail in section 14.5 of the thesis. These parallels between the lexica of village sign languages are also evident in the domain of kinship. In Adamorobe Sign Language (Nyst 2007a:100) there are only terms for grandparent, mother, father, and offspring. The kinship system of Providence Island Sign Language appears to be even more restricted with its three kinship terms for mother, father, and offspring (Woodward 1978:128). Both languages indicate non-lineal relatives in the same way that Kata Kolok does, by using the general sign meaning 'same'. Providence Island Sign Language has also been reported to have a highly context-dependent lexicon (Washabaugh, Woodward, & DeSantis 1978).

The global patterns of village sign languages are highly suggestive of a developmental path, along which languages might accrue a lexicon. However, it should be noted that these five village sign languages represent a small subset of the village sign languages around the world (see Table 2.1 on p. 24). Given the nature of the differences between village sign languages and the wider hearing communities, there is one factor that should not be overlooked: formal deaf education. That is, with rare and recent exceptions, village sign languages have not been used in formal deaf education.<sup>37</sup> By contrast, the origins of urban sign languages have often been traced to the establishment of formal deaf education.

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<sup>37</sup> To my knowledge Kata Kolok and Alipur Village Sign Language are the only exceptions.

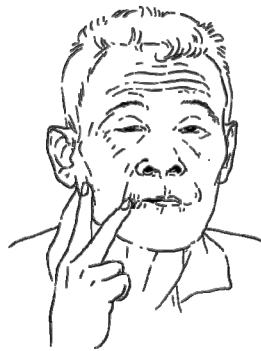
Furthermore, in the case of urban sign languages, a lot of time and energy in formal deaf education goes into teaching deaf children to read and write, and to speak. This emphasis may catalyse the process of calibration between the lexicon of a sign language, and the spoken language that surrounds it. Of particular interest in this regard is the documentation of an indigenous variety of sign language which has emerged in the capital of Mali, outside the context of deaf education (Nyst p.c. July 2011). If deaf education is crucial to the development of the signed lexicon, the Bamako Sign Language lexicon may structurally resemble village sign languages, despite the fact that its sociolinguistic setting parallels other urban signing communities.

#### *4.4 Numeral incorporation*

Another key structure, specific to sign language, and relevant to this thesis is numeral incorporation. Numeral incorporation is a morphological process where the cardinal number sign is fused with a content sign to produce a unified, compositional meaning. In American Sign Language, for instance, the sign for YEAR and the cardinal number THREE can be merged to mean ‘three years’. In many sign languages the paradigms that exhibit numeral incorporation are extensive and include the signs for years, months, minutes, and seconds, but also school grades, and various currencies (see for instance Chinchor 1982; Massone 1991; Zeshan 2000:73). In Kata Kolok there are three signs that exhibit the phenomenon of numeral incorporation: ONE-DAY-AGO, THOUSAND-RUPIAH, and SCHOOL-GRADE.

The sign for ONE-DAY-AGO, or ‘yesterday,’ is produced in the cheek with the index finger. Similarly, the concepts of two to four days ago are conveyed by placement of the cardinal number on the cheek. ‘The day before yesterday’ is thus conveyed by both the index finger and the middle finger on the cheek, while the concepts of three and four days ago are expressed by the appropriate number of

fingers at the same place of articulation. In Figure 4.7 the sign for ‘the day before yesterday’ is illustrated with a still from the corpus.



**Figure 4.7 TWO-DAYS-AGO**

For references to events that occurred longer than four days ago, the sign PIDAN ‘the time when’ is used.<sup>38</sup> Alternatively, the specific number of days can be expressed by producing the sign for COUNT at the cheek followed by the cardinal number. Example 4.2 illustrates this. ‘Tomorrow’ and subsequent days are indicated by the cardinal numbers and thus do not constitute such a paradigm.

**Example 4.2 ‘Six days ago’**

NM

MG GO-AWAY COUNT-DAYS SIX GO-AWAY

ND

‘He went. Six days ago he went away.’

PiKe4jan7\_6daysago.mpg

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<sup>38</sup> For more information about the usage and semantics of PIDAN see section 8.4.2.

Numeral incorporation also occurs with the sign that means *1,000 rupiah*. The regular sign for a 1,000 rupiah note is made with an IX-hand with a curved upward movement. The fused sign is produced with an index finger making an upward movement from the wrist. The same movement can be made with cardinal numbers up to nine to mean 2,000 to 9,000 rupiah. In the examples below the difference is illustrated with a sequential use of the sign THOUSAND-RUPIAH followed by the cardinal number ONE (Example 4.3), and the use of the sign THOUSAND and FIVE (Example 4.4). Stills 4.3 and 4.4 display these respective constructions. In the left-hand image of Still 4.3 the signer produces the sign THOUSAND by an IX-hand with a downward movement. In this case the downward movement ends in a lax production of the IX-hand, closely resembling a B-hand. In the right-hand image of Still 4.3 the signer produces the numeral ONE. Figure 4.4 presents snapshots of the initial and final position of the hand in producing a form of THOUSAND#FIVE.

#### Example 4.3 Sequential number construction

↓ Still 4.3 ↓

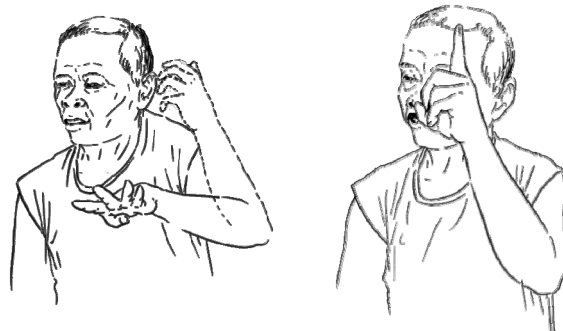
NM

MG THOUSAND-RUPIAH ONE

ND

'One thousand rupiah.'

Gta6oct7\_THOUSAND\_ONE.mpg



**Still 4.3** Sequential number construction: THOUSAND^ONE

Example 4.4 Numeral incorporation

↓ Still 4.4 ↓

NM

MG THOUSAND-RUPIAH#FIVE

ND

'Five thousand rupiah.'

GD3jan7\_THOUSANDFIVE.mpg



**Still 4.4** Numeral incorporation: THOUSAND#FIVE



Finally, numeral incorporation has also been observed in references to school grades. The neutral form of school grade is made by laying the index finger on the contra-lateral upper arm.<sup>39</sup> In indicating the school grades from one to five, the cardinal number is produced on the same place of articulation. For grades higher than five, the neutral form of SCHOOL-GRADE is followed by the cardinal number.

#### 4.5 *Classifiers*

Classifiers are sign language specific structures allocated to characterizing the shapes and sizes of objects and to denote spatial relations and motion events (see the papers in Emmorey 2003). Despite some similarities to verbal classifier constructions in spoken languages, many issues would need to be resolved in order to analyse them typologically alongside spoken language classifiers (Aikhenvald 2003; Schembri 2003). In the sign linguistic literature dealing with classifiers, many different types of classifiers have been distinguished (Emmorey 2003). Two types of classifiers are of particular relevance to this thesis: entity classifiers and handle classifiers. *Entity classifiers* are signs that provide iconic information on the inherent properties of an entity, including shape information or animacy, and attach to verbs of movement or location. They are especially important in spatial-locative constructions and therefore a key structure for this thesis. Section 4.5.1 addresses the use of entity classifiers in Kata Kolok discourse and serves as a foundation for the chapters in Part IV of the thesis. Handle classifiers represent the way in which an object is handled by selecting an appropriate handshape. Handle classifiers occur in ditransitive constructions, e.g. ‘giving someone a flower,’ and in the

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39 The sign for school grades is one of few examples that may be borrowed from the variety of Indonesian Sign Language used at the deaf school in Jimbaran in the south of Bali.

description of carrying and placement events, e.g. ‘putting a cup on the table’ (section 4.5.2).

#### 4.5.1 Entity classifiers

Marsaja (2008:172-5) presents an exhaustive description of entity classifiers in Kata Kolok based on differences in handshape, orientation, and movement. Table 4.5 presents an overview of the most common entity classifiers in Kata Kolok discourse. There are two ways in which the Kata Kolok entity classifier paradigm diverges from descriptions of the paradigms in other sign languages. The Kata Kolok forms of entity classifiers are defined primarily on the basis of orientation and movement pattern rather than handshape, and Kata Kolok has fewer handshapes for entity classifiers than other sign languages. As Marsaja mentions, the choice for a particular entity classifier is not solely motivated by the semantic class an entity belongs to, but by the specific perception of that entity. The classifier sign for animate, tall entities (usually people) is produced by the full hand in a vertical position with the finger tips upward representing a treading movement by moving the lower upper arm up and down. However, if the same referent were asleep this could be shown by producing the B-hand in a palm downward orientation without the movement. The signed context would still allow one to identify this entity classifier as indicating a sleeping individual. Outside of the signed context, however, this still, palm downward orientation would be taken to indicate a surface of some kind.

ENTITY CLASS	REFERENTS	HANDSHAPE	ORIENTATION	MOVEMENT
Up-right entity	Person, monkey, cow	B, IX	Upward finger orientation	Treading
Multiple individuals	People	5	Upward finger orientation	Treading
Animals	Dog, cat, cow	B	Palm sideways	Treading
Small animate	Mouse, rabbit	Curved 5	Palm downward	Treading
Sliding animate	Snake, eel	IX	Palm downward	Slithering

Sliding animal	Seal, big snake	5	Palm downward	Slithering
Flying animals	Bird, bat, bug	5	Palm downward	Bouncing
Two-wheel vehicle	Bike, motorbike	B	Palm sideways (neutral)	Straight
Four-wheel vehicle	Car, truck, bus	B	Palm downward	Straight
Machine-operated flying object	Aeroplane	Y, thumb-IX-pinky, B	Palm downward	Straight
Water vehicle	Boat, ferry, ship	B	Palm downward	Waving
Flying object	Kite	B	Palm downward	Swinging

**Table 4.5** Entity classifiers in Kata Kolok discourse  
(based on Marsaja 2008:173)

As signers have two hands, entity classifiers can be produced simultaneously; these bimanual constructions are called simultaneous classifier constructions (Perniss 2007:39ff). In Example 4.5, for instance, a signer describes how a school teacher used to cycle across a bridge in Singaraja, which was built by the Dutch during colonial times. The simultaneous classifier construction describing this scene is marked by bold typeface in the transcript, and Still 4.5 presents a snapshot of this simultaneous classifier construction. Where there is a Figure-Ground relationship between the classified entities, the non-dominant hand represents the Ground object, while the dominant hand represents the Figure object.

Example 4.5 Figure and Ground in simultaneous classifier construction

NM

MG BOSS WRITE IX'village school'

ND

IX'Bengkala'

'There was a teacher from Bengkala...

↓ Still 4.5

NM

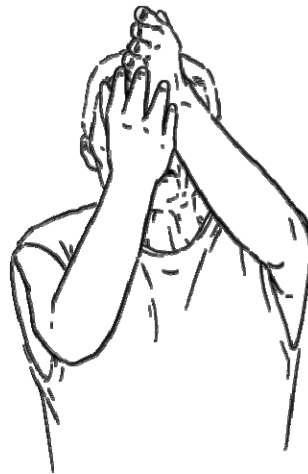
MG BIKE-RIDE IX'Kubutambahan village' BIKE-RIDE **CL:B'bicycle'**

ND

**CL:Bflat'bridge'**

...who always rode his bicycle across the bridge from Kubutambahan.'

Gta6oct7\_simultaneousclassifierconstruction.mpg



**Still 4.5** Simultaneous classifier construction: a bicycle crossing a bridge

Simultaneous classifier constructions need not have a clear Ground or Figure object when they concern a reciprocal situation, e.g. where two entities are facing

each other. In Example 4.6 (on p. 104), a farmer is talking about his ploughing activities. The final utterance employs a simultaneous classifier construction in which the two cows are represented by the up-right entity classifiers. The simultaneous classifier construction describing this scene is marked by bold typeface in the transcript, and Still 4.6 presents a still of this simultaneous classifier construction. The denotation of Figure-Ground arrangements by simultaneous classifier constructions, along with the exact spatial semantics of such bimanual constructions, form the core of Part IV of the thesis.

Example 4.6 Simultaneous classifier construction without Figure-Ground relation  
(part 1)

NM

MG FINISH PLOUGH-BAR PLACE-BAR-ON-COWS'-NECK TIE-UP

ND

'After that, I put the ploughing bar on the cows' necks and tied them up...

NM

MG NECK-FITTING FINISH

ND

...with a neck-fitting.'

NM

MG FINISH PULL-LEAD MOVE-LEAD PULL-LEAD PULL-LEAD

ND

'I moved and pulled the lead...

NM Puffed cheeks

MG WHIP-COWS LEAD-COWS-FORWARD

ND

...and then started whipping the cows forward.'

Example 4.6 Simultaneous classifier construction without Figure-Ground relation  
(part 2)

↓ Still 4.6

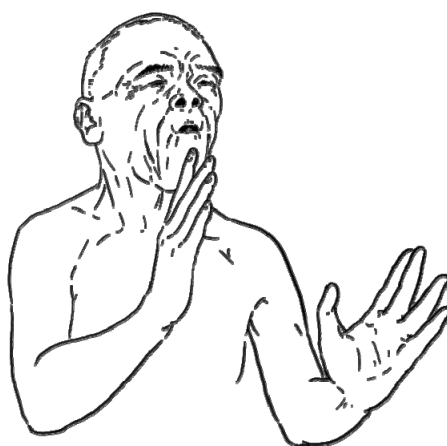
NM

MG **CL:B'cow'**

ND **CL:B'cow'**

'The cows walked forward well.'

KK-IntheHutDn1\_entity\_classifiers.mpg



**Still 4.6** Simultaneous classifier construction without Figure-Ground relation

Handle classifiers are designated handshapes that iconically represent the indirect object of ditransitive constructions; the handshape indicates the way the object is usually handled. Example 4.7 stems from a narrative about a ghost that lives in the village cemetery, and is believed to eat infants. The handle classifier glossed as Handle CL:S‘carry person’ indicates that the ghost picks up the infant with an S-handshape. In Still 4.7 the initial and final frame of this handle classifier is represented.

↓ Still 4.7 ↓

NM  
MG    INFANT    EAT                      DIE  
ND                      Entity CL:B'child'  
'It (the ghost) would eat the infant and it would die.'

106



**Still 4.7** The initial and final frame of the handle classifier used to indicate “carrying a body” in Kata Kolok

Table 4.6 presents additional examples of hand classifiers in Kata Kolok.

HANDSHAPE	TYPES OF OBJECTS
Big C-hand	cups
S-hand, B-hand	individuals
Bunched hand	bank notes, flowers
F-hand	coins, tablets

**Table 4.6** Examples of handle classifiers in Kata Kolok

#### 4.6 *Intensification*

This section examines the use of *intensification* to mark the enhanced magnitude of the predicated quality. Intensification can co-occur with a large set of lexical signs, and the particular quality that is being enhanced depends on the meaning of the lexical sign to which it is appended. The complete form of intensification is made by the simultaneous production of pursed lips and squinted eyes with a manual sign as well as enlargement and (faster) repetition of that manual sign. The sections below show that the formal implementation of intensification is determined by the phonological properties of the base sign. Furthermore, when the intensifier



coincides with a referential sign, it indicates semantic focus. Conversely, when it coincides with a predicative sign it marks the magnitude of a quality.

#### 4.6.1 Intensification of colour signs

Kata Kolok's four colour terms have been described in detail on p. 89 above. Importantly, Kata Kolok signers can also use pointing to objects in the vicinity as a strategy to indicate colours. This phenomenon is described in more detail in section 14.5. Intensification is characterised by the simultaneous production of two non-manual markers and by modifying the formal characteristics of the manual sign itself. The non-manual markers are pursed lips and squinted eyes. The manual adjustments to the sign include: enlargement, repetition, and/or a faster movement of the manual sign in cases where it has inherent movement. These signals are all indicators of intensification, yet need not always coincide, and the phonetic implementation of intensification depends on the formal properties of the sign itself. This becomes particularly clear from reviewing the intensification of colour signs. First of all, the sign WHITE already has inherent repetition, and presumably for this reason the signs are not repeated in their intensified forms. However, inherent movement is repeated, enlarged, and produced faster in the case of GRUE. The intensification of GRUE is illustrated by both a neutral and intensified form of the sign in Example 4.8 and Example 4.9 below. Stills 4.8 and 4.9 present the initial and final frames of these respective forms.

##### Example 4.8 GRUE

GRUE CLOSE

'Close to blue-green.'

PSud4aug7\_GRUECLOSE.mpg



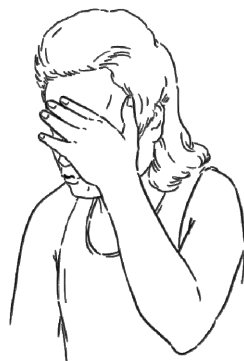
**Still 4.8** Initial and final frame of GRUE

Example 4.9 Intensified form of GRUE

GRUE#intens

'Saturated blue-green.'

PSud4aug7 \_GRUEINTENS.mpg



**Still 4.9** Initial and final frame of GRUE#intens

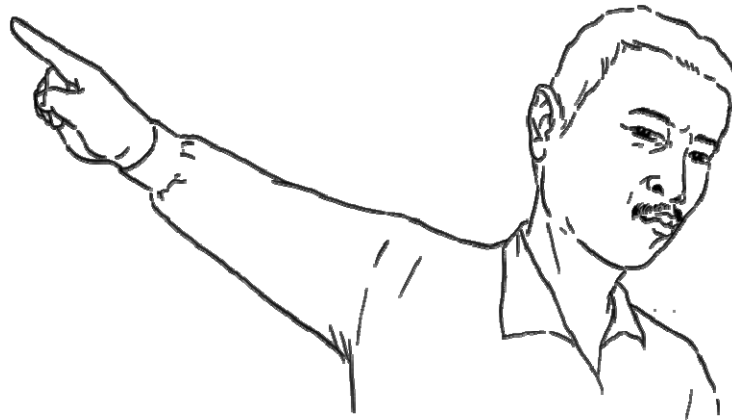
The movement of WHITE is not modified, but the sign is still intensified by the use of squinted eyes. Similarly, the sign RED is intensified by movement repetition and with the squinted eyes but without the pursed lip marker. Like RED, WHITE does not attract the pursed lip marker. The absence of this marker in the case of WHITE and RED is presumably caused by the fact that the lips function as place of articulation in these manual signs. Importantly, intensification occurs only with lexical colour signs and not with non-lexical pointing signs that indicate a colour (de Vos 2011). Further constraints on the distribution of the intensifier become clear from the discussion of locative pointing signs with the intensifier, in the section below.

#### 4.6.2 Intensification of pointing signs

In contrast to the intensification of colour signs, the intensification of pointing signs is either made by immediate repetition of the sign or by the pursed lip marker, but never by both. Repetition is used to indicate *contrastive focus*; repetition can be used to distinguish a visible object from a restricted set of competitor referents by using an index finger point. This happens when pointing at a single figure in a poster, for example, or when picking out fruits at a market. Repetition may also occur in first person references. It is then used as a single-word utterance, or to express possession in response to the question 'whose is it?' In these cases repetition seems to indicate *focus*, i.e. as a functional marker of new information. The repetition of first person pointing signs is also used to express empathy in case a person has just hurt him/herself. In this latter case the sign functions as an interjection. In none of these instances is the pursed lip marker used.

Given that the pursed lip marker is not used with pointing signs that indicate colours, or with the intensified pointing signs that are used to indicate focus, one might wonder whether pointing signs may be marked by pursed lips at all. Locative pointing signs are intensified by pursed lips and enlargement, but not by

repetition of the sign's movement. The intensification of these locative pointing signs indicates distance and is discussed in more depth in section 14.2.1. The phenomenon is illustrated in Figure 4.8.



**Figure 4.8** Pursed lips and squinted eyes with a locative index finger point indicate a 'very distant location'

In the case of pointing signs, the manual and non-manual aspects of intensification have separate functions. Manual modifiers (repetition, enlargement) are used to supply focused information, while non-manual modifiers (pursed lips, squinted eyes) indicate distance. This raises a question: are these two types of modification part of the same phenomenon of general intensification? The pointing signs that attract repetition have a referential meaning while the pointing signs indicating locations are used predicatively as they indicate a quality, i.e. the distance of a referent. It thus seems that non-manual modification is used to modify the intensity of the quality expressed by intransitive predicates, while repetition indicates contrastive focus. In the case of colour signs these two patterns are not as easy to

separate as they function as predicates, and both kinds of modification may occur with the same manual sign.

#### 4.6.3 Intensification of other signs

Thus far it has been shown that intensification occurs with colour signs and with locative pointing signs. This section discusses two additional types of intensification, one in which the temporal adverb PIDAN ('the time when') is intensified, and another in which intensification is spread across the sentence. The former example is from a narrative set in colonial times and the signer indicates that the events happened a long time ago by using the temporal adverb PIDAN with pursed lips and squinted eyes (see Figure 4.9). Outside the context of this narrative this expression could also indicate a time in the far future, since PIDAN, in common with the Balinese word *pidan*, means 'the time when'. The contextual disambiguation between past and future references is discussed in more detail in chapter 8. The neutral sign PIDAN already contains repetition, and the movement is not enlarged.



**Figure 4.9** PIDAN#intens 'a long time ago/in the far future'

The second example of the use of intensification stems from a narrative discussing the appearance of a deaf ghost. The signer states that the ghost has hair covering its whole body. The pursed lip marker here stretches over two signs - BODY-COVERED and SAME - to indicate that the predicate holds for the whole body. The left-hand and right-hand images of Still 4.10a display the initial and final frame of the intensified form BODY-COVERED#intens. The intensified form SAME#intens is presented in Still 4.10b.

#### Example 4.10 Intensified form of SAME

↓ Still 4.10a↓

↓ Still 4.10b

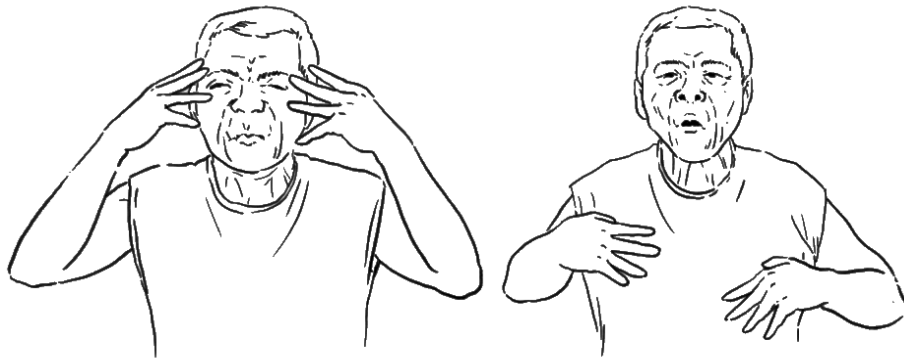
NM

MG BODY-COVERED#intens SAME + + + #intens

ND

'It is the same all over his body.'

Gta6oct7\_SAMEINTENS.mpg



**Still 4.10a** Initial and final frame of BODY-COVERED#intens



**Still 4.10b** Intensified form SAME#intens

#### 4.6.4 The semantics of intensification

The examples above show that Kata Kolok deploys general intensification to indicate the magnitude of the quality predicted by the sign with which it is combined. When combined with a lexical colour sign it expresses the brightness of a given hue; in the case of a locative expression it indicates the magnitude of the distance; when combined with the temporal adverb PIDAN it indicates the amount of time from the present moment to the event; and with signs BODY-COVERED SAME it indicates the mass of hair across the ghost's body. Importantly, the constraints of intensification are not just semantically motivated. That is, while intensification can occur with iconic-indexical colour signs such as BLACK/HAIR, it cannot be used with pointing signs that creatively indicate objects in the vicinity to provide a colour description. Granting this, the functionality of the intensifier is dependent on the syntactic slot filled by the sign. This becomes particularly clear from examples where pointing signs fill different information structure slots. When the intensifier coincides with a referential pointing sign, it indicates contrastive focus. Conversely, when it coincides with a predicative pointing sign it marks magnitude.

#### 4.7 *Aspect*

Linguistic tense refers to the timing of an event in terms of future, present or past. The English *-ed* marker, for instance, transforms a verb into a past tense form. In Kata Kolok tense is not marked on verbs. From a cross-linguistic perspective this is not surprising; there are not many reports on the marking of tense on verbs in sign language literature (but see Jacobowitz & Stokoe 1988; Sapountzaki 2007), and additionally, many spoken languages lack tense marking. Aspectual systems, on the other hand, are not uncommon to sign languages (see for instance Sandler 1990; Zeshan 2003a). Sections 4.7.1 and 4.7.2 describe two temporal aspect markers in Kata Kolok that are relevant to the Part V of the thesis in particular: completive aspect and negative completive aspect. Section 4.7.3 describes a distributive aspect marker used with transitive predicates; the distributive aspect marker is of particular relevance to section 4.8.2.

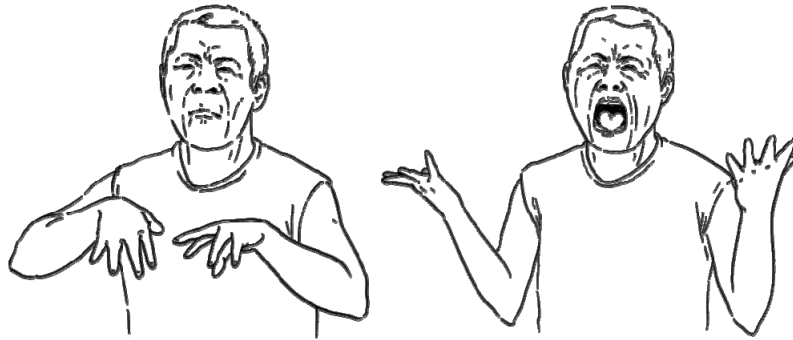
##### 4.7.1 Completive aspect

One of most striking aspects of Kata Kolok discourse for hearing people is the frequent occurrence of a loud lip smack, which is used as a completive aspect marker.<sup>40</sup> In its full form, the sign is produced with two 5 hands rapidly turning palm upward along with a lip smack. The manual form of the completive aspect marker is glossed as FINISH and its non-manual counterpart is glossed as ‘pah’. The initial and final position of this form is illustrated in Figure 4.10. The form can also occur one-handed.

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40 In phonetic terms the lip smack is a bilabial glottalised ingressive.





**Figure 4.10** Initial and final frame of FINISH#pah

When the non-manual completive aspect marker is attached to a lexical predicate, it can occur without the manual part. Conversely, the manual part of the completive does not occur without the non-manual component. In Example 4.11, the signer combines the sign GO-FROM-HERE-TO-B with the non-manual component of the completive aspect marker, which has been glossed as ‘pah’. The example comes from a narrative about an encounter with a deaf ghost. Although the ghost was deaf, it did not want to talk to the narrator and disappeared in the direction of location ‘B’.

**Example 4.11** Non-manual completive aspect I

NM		‘pah’			‘pah’
MG	GO-FROM-HERE-TO-B	GHOST	TALK		GO-FROM-HERE-TO-B
ND					

‘The ghost went away, (I tried to) talk, (but it) went.’

Gta60ct7\_GO-AWAYcompletiveaspect.mpg

Another sentence in which the non-manual completive aspect marker is used with a predicate is shown in Example 4.12 below. This utterance comes from a narrative by a signer who discusses a financial dispute between his son and daughter-in-law, who live in the same compound. The signer explains that he had already given them three hundred thousand rupiah (RED^THREE).<sup>41</sup> Importantly, although the translation indicates that the event has happened in the past by using the past tense, the Kata Kolok sentence only indicates that the event is discontinued, whether in the future or in the past. It is only through implication that the historical interpretation arises. The relationship between completive aspect and temporal inference is addressed in chapter 8 of the thesis. In chapter 14, we see that this non-manual aspect marker can also be used with predicative pointing signs. These constructions are taken as evidence for the syntactic integration of pointing signs in Kata Kolok.

Example 4.12 Non-manual completive aspect II

NM ‘pah’

MG GIVE B:i RED^THREE

ND

‘I had given (them) three hundred thousand rupiah.’

Gta60ct7\_GIVEcompletiveaspect.mpg

#### 4.7.2 Negative completive aspect

The negative completive in Kata Kolok is glossed as NOT-YET, and the sign is produced with a protruded tongue. Example 4.13 stems from a dialogue between two sisters-in-law about their work. One of the women does not always receive her payments for her day’s labour when she works in the rice fields, as she explains in

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<sup>41</sup> 100,000 Indonesian rupiah bank notes are red and in Kata Kolok are referred to as such.

the extract below. The second part of her utterance is marked by raised eyebrows (rb), indicating her surprise regarding the fact that she did not get paid.

Example 4.13 Negative completive aspect

NM

MG IX'there' BUILD

ND

'For working there...'

NM

rb

MG NOT-YET Handle CL:S'money' MONEY NOT-YET Handle CL:S'money'

ND

'(I) haven't received any money.'

PiKe4jan7\_negative\_completive.mpg

As with the completive aspect marker, the non-manual component can also be attached to predicates. This is illustrated in Example 4.14. As described in section 2.2.3, the deaf men are responsible for burying the dead at the village cemetery. The conversation between two deaf women here followed a recent death in the village. One of the signers (on the right-hand side in the video) discusses the fact that her deaf husband will assist with the burial of the deceased on the following day. The other signer (on the left-hand side in the video), whose husband will also be expected to dig the grave, responds affirmatively by signing 'Yes, tomorrow; there has not been a burial yet.' In signing this she does not use the lexical sign NOT-YET but instead produces the sign BURY together with the protruded tongue during the initial hand position of the sign. The left-hand image of Still 4.14 illustrates this by a snapshot of the initial hand position of the sign BURY, which is accompanied by a protruded tongue. The left-hand image of Still 4.14 displays the final hand positions of the sign BURY. By this point, the signer had retracted

her tongue. Similar to completive aspect, negative completive aspect interacts with temporal inference in discourse, and this phenomenon is discussed in chapter 8 of the thesis.

Example 4.14 Non-manual negative completive

↓ Still 4.14 ↓

NM	<u>nod</u>	<u>pt</u>	
MG	ONE	BURY	ONE
ND			

‘Yes, tomorrow; there has not been a burial yet.’

PiKe4jan7\_negative\_completive\_nonmanual.mpg



**Still 4.14** Initial and final frame of BURY#pt

### 4.7.3 Distributive aspect

The completive and negative completive aspects have both manual and non-manual components, and are added sequentially and/or simultaneously to the signed utterance. The distributive aspect marker, on the other hand, is essentially a bound morpheme that changes the phonological properties of the lexical predicate:

the lexical predicate is repeated at various locations in the signing space. In Example 4.15 the sign HIDE is marked for distributive aspect. The lexical sign has been repeated at various locations in space. This illustrated by the frames in Still 4.15.

Example 4.15 Distributive aspect

↓ Still 4.15 ↓ ↓

NM

MG SIGN-NAME'KS' EAT BUY HIDE#DISTR TALK SIGN-NAME'L'

ND

'KS bought food and hid it in several places, L said.'

Gta6oct7\_HIDE.mpg



**Still 4.15** The sign HIDE combined with the distributive aspect marker as produced at subsequent locations in the signing space

At first sight, the fact that the distributive aspect marker is expressed through spatial modification seems remarkably similar to the process of spatial verb agreement, as here too, the sign is meaningfully directed in the signing space.

However, the distributive aspect marker cannot be used with the lexical sign GIVE, for example, or with other transitive signs that have a non-spatial meaning. The Kata Kolok "distributive" marker is therefore best analysed as a type of locative marking, which by implication may receive a distributive interpretation (see Rathmann 2005 for a similar analysis of American Sign Language). The differences between the distributive aspect marker, a handle classifier, and a spatially modified agreement verb, pertain to the issue of 'directionality' in particular. Section 4.8.2 discusses in detail the facts that bear upon these distinctions.

#### *4.8 Verb classes*

All languages have to resolve the issue of 'who did what to whom' when they use a transitive predicate. Languages may have varying strategies to do so: verb inflection, case marking, and constituent ordering are some of the linguistic structures that are used to link subject and object to the predicate. Most sign languages reported thus far have been shown to spatially modify predicates to indicate the subject and object of a transitive event (see for example Engberg-Pedersen (1993:154f) on Danish Sign Language; Liddell (2003:97ff) on American Sign Language). The only known exceptions to this pattern are Kata Kolok and Al-Sayyed Bedouin Sign Language (Sandler et al. 2005; Zeshan 2006a). The sections below are devoted to this exceptional feature of Kata Kolok grammar. Section 4.8.1 provides details on this sign-language specific structure of spatial verb agreement in relation to other verb classes. Section 4.8.1 confirms Zeshan's initial observation that spatial agreement does not exist in Kata Kolok by presenting corroborating evidence from the corpus. While Kata Kolok does not have agreement verbs, section 4.8.3 reveals that Kata Kolok exhibits evidence for a special class of body-anchored predicates. This section is concluded by a discussion of the potential sources of this unusual feature of Kata Kolok (section 4.8.4).

#### 4.8.1 Plain, agreement and spatial verbs

Most sign languages documented so far exhibit a tripartite distinction of verb classes based on their sign-spatial properties (Sandler & Lillo-Martin 2006:34). These three verb classes - plain, agreement, and spatial - were first described by Padden (1988). Plain verbs cannot be marked with agreement morphology; despite their name, however, they can receive other types of morphemes such as aspectual marking. Figure 4.11 presents a still image of the British plain verb THINK, which has only one form regardless of the subject of the verb.



**Figure 4.11** The plain verb THINK in British Sign Language  
(courtesy Nick Palfreyman)

The directional movements of agreement verbs mark the conceived position of the subject and the object. In other words, these transitive verbs are directed in space from subject to object to indicate the participants of an event. For example, the verb could move from the signer's own body to the (conceived) location of the

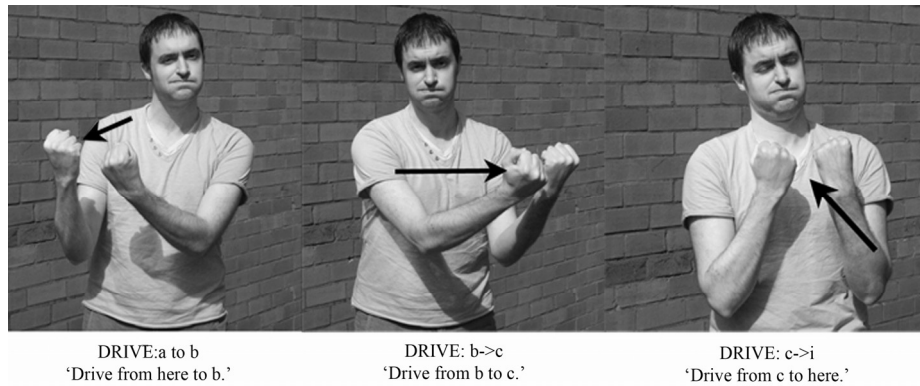
addressee to indicate first person as subject, and the addressee as object. Conversely, when the sign is directed from the (conceived) location of the addressee towards the signer's body the reverse interpretation arises. Likewise, a verb may stretch laterally across the signing space to indicate that a third person is imposing an action on another third person referent. Figure 4.12 shows examples of three forms of GIVE in British Sign Language that mark grammatical person by virtue of their sign-spatial features. Agreement verbs have also been referred to in the literature as indicating verbs (Liddell 2000).



**Figure 4.12** The agreement verb GIVE in British Sign Language  
(courtesy Nick Palfreyman)

The third class of verbs are spatial verbs that are spatially modified in the signing space to indicate locations. An example of a spatial verb is the British sign DRIVE, displayed in Figure 4.13. This third class of verbs utilises the signing space topographically rather than metaphorically. In other words, while the verb DRIVE makes identical movements in space as the agreement verb GIVE, this sign-spatial movement receives an interpretation in terms of location rather than grammatical person.





**Figure 4.13** The spatial verb DRIVE in British Sign Language  
(courtesy Nick Palfreyman)

Since Padden (1988), the fundamental distinction between agreement verbs and spatial verbs has been criticised. The semantic distinction between spatial and non-spatial functions of the signing space, in particular, is not clear-cut (Engberg-Pedersen 1993:309). Notwithstanding these criticisms, the sign-spatial modification of transitive verbs as a strategy for core argument resolution - that is, to indicate the subject and object - is prevalent across sign languages. For this reason, many sign language researchers have argued that the strategy is a universal pattern (Meier 1990; Taub 2001:226f; Aronoff et al. 2005). Indeed, Aronoff et al. (2005) have suggested that this would inevitably be the case since it draws on universally available iconic properties of the gestural modality:

"The striking cross-linguistic similarity in both verb classification with respect to agreement and in agreement morphology itself among sign languages speaks to the power of iconicity: languages will use iconicity if they can."

Aronoff et al. 2005:324

Kata Kolok has been reported not to exhibit any evidence of agreement verbs (Zeshan 2006a). That is, the language does not have an integral system of spatially inflected transitive verbs that mark core arguments (Zeshan 2006a; Zeshan, Marsaja, & de Vos in prep.). The next section presents corroborating evidence from substantial amounts of spontaneous data as well as a few putative counterexamples.

#### 4.8.2 Transitive constructions in Kata Kolok

The claim that all sign languages display a system of spatial verb inflection is not easily falsified. It is easier to provide evidence for a particular phenomenon, than it is to claim its absence. Furthermore, spatial verb inflection raises methodological issues that complicate matters. The cross-linguistic study of sign languages has shown that they may vary in the types of verbs that attain spatial inflection (Meir 1995; Mathur & Rathmann 2006; Hong 2009). Moreover, recent evidence shows that, in spontaneous discourse that forms part of the corpus of Australian Sign Language, the spatial modification of transitive predicates is not obligatorily used. That is, 30-35% of agreement or ‘indicating’ verbs are not modified as expected (de Beuzeville, Johnston, & Schembri 2003:69). Spatial agreement is not the only sign-spatial structure in sign languages, and this necessitates a clear-cut distinction between what counts as an agreement verb, and what does not. The following sections address each of these points with reference to a corpus-based analysis of Kata Kolok.

##### *Corpus analyses of transitive predications*

The first question concerns which verbs we expect a sign language to modify: if a sign language were to have a limited set of modifiable transitive predicates, what would they be? Of particular interest would be transitive predicates that describe figurative transactions of abstract notions such as information transfer or love,

because these verbs cannot be mistaken for spatial verbs. A number of signs that have been found to inflect spatially in many sign languages,<sup>42</sup> but only have a single form in Kata Kolok, include: TALK, GIVE, TAKE, SEE, LEARN, BUY, RESPECT, ASK, and SUMMON (Marsaja:168-171). In addition to this list, the present study has identified WANT, MARRY, CALL-ON-TELEPHONE, YELL-AT, and ADOPT as plain verbs. From the signs listed above, many can express multiple meanings in Kata Kolok depending on the construction in which they occur. The lexical sign TALK, for instance, is used in Kata Kolok to convey ‘sign language,’ ‘to tell,’ ‘to ask,’ and ‘to inform,’ along with other similar types of communicative events, given the appropriate context. Similarly, the sign WANT can mean ‘to want (someone),’ ‘to like (something),’ ‘to love (someone),’ ‘to want (something),’ or ‘to plan (something)’. The same form of BUY is used for the act of selling, buying, and to refer to money. Similarly, the sign GIVE in Kata Kolok can refer to ‘to give,’ ‘to receive,’ or ‘to request’ depending on the signed context in which it occurs. Certain concepts do not have separate signs in Kata Kolok and do not appear on the list above for this reason. There is no lexical sign meaning ‘to help,’ for example.

Given the variability in the use of spatial agreement in the spontaneous corpus of Australian Sign Language (de Beuzeville et al. 2003), one might ask whether such variability exists in the Kata Kolok corpus, too. For example, do signers, perhaps rarely, spatially inflect transitive predicates? To answer this question properly, it is necessary to look at a large quantity of data. I Gede Marsaja has kindly allowed me to include his annotation files in the present analysis. The total set of spontaneous discourse constitutes over six hours of spontaneous Kata Kolok

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<sup>42</sup> For examples of agreement verbs see Liddell (2003) on American Sign Language, de Beuzeville et al. (2003) on Australian Sign Language, Sutton-Spence & Woll (1999) on British Sign Language, Engberg-Pedersen (1993:147-213) on Danish Sign Language, and Hong (2009) on Hong-Kong Sign Language.

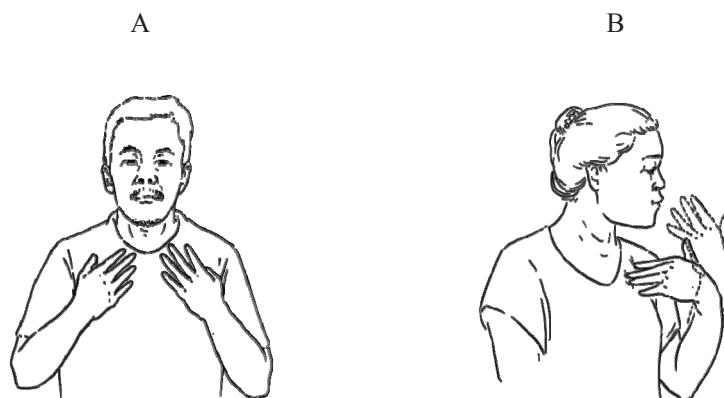
discourse, including monologue narratives, dyadic conversations, and group conversations, from a wide range of topics. Table 4.7 (on p. 127) presents the number of tokens of each transitive predicate listed above, as well as the number of times it was found to be modified spatially. Note that the sign BUY is also used to refer to ‘money.’ This sign occurs 475 times in the corpus, but it is only used 46 times to refer to the act of buying or selling. Only those cases, where the sign unambiguously occurs as a predicate, are included below. Furthermore, the only predicate for which a modified form was found is the sign TALK. This means that, using Padden’s (1988) trichotomy, apart from TALK, all of the transitive predicates listed below are plain verbs. The use of this modified form, glossed as TALK-TO-ME, is described in more detail below.

PREDICATE	NO. OF OCCURRENCES	NO. OF INFLECTED FORMS	TOTAL
TALK	317	3	
GIVE	323	n/a	
WANT	129	n/a	
BUY	46	n/a	
MARRY	11	n/a	
RESPECT	7	n/a	
CALL-ON-TELEPHONE	2	n/a	
ADOPT	1	n/a	
Total no. of tokens	836	3	839
Percentages	99.6%	0.004%	100.0%

**Table 4.7** Selected transitive predicates in 6 hours of spontaneous Kata Kolok discourse  
(percentages indicate the relative frequencies of inflected and non-inflected tokens for these selected transitive predicates)

*The case of TALK-TO-ME*

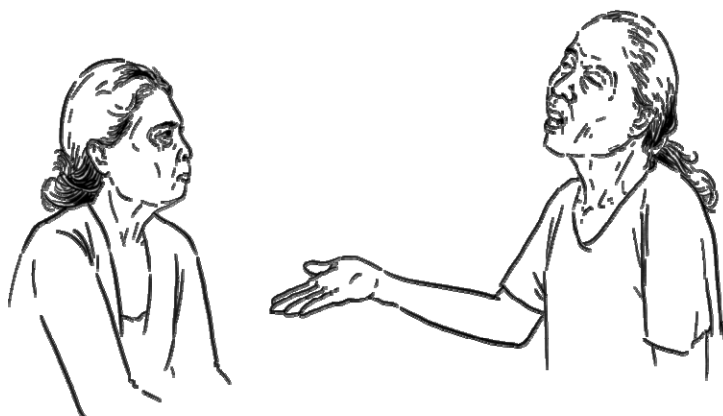
Corpus analysis has revealed that there are two forms to indicate communicative acts in Kata Kolok: a general form glossed as TALK, and a form used when the patient is first person – glossed as TALK-TO-ME. Both forms are illustrated in Figure 4.14. The predicate TALK in Kata Kolok is formed by two B-hands placed on the lateral axis with the fingertips oriented towards each other and with alternating movement towards each other. This movement is indicated by the arrows in panel A of Figure 4.14. This form of TALK may be combined with various kinds of agents, including first person, second person, and multiple referents, and it can also be used as a noun. In addition to this neutral form, there is also a form of the verb that is one-handed and directed at the signer's own chest or face. The form directed at the signer is only found to indicate the signer as the recipient of information, and is glossed as TALK-TO-ME. The right-hand still of Figure 4.14 (panel B) displays this form.



**Figure 4.14** The signs TALK (panel A) and TALK-TO-ME (panel B)

With respect to the use of TALK-TO-ME ('I was told') it should be noted that this spatial modification is not an obligatory aspect of Kata Kolok syntax. That is, the sentence does not become ungrammatical when the sign is replaced by the neutral form TALK. Furthermore, these two forms do not constitute a regularised inflectional paradigm that can be applied to other verbs, or to other person distinctions. The sign cannot be sign-spatially transformed to mean 'you talk to me,' for example. For this reason it does not follow a pattern of inflectional morphology, but rather the signs constitute two iconic forms, independently listed in the lexicon. Hence, unlike other sign languages, Kata Kolok does not have a class of true agreement verbs.

The predicate GIVE in Kata Kolok normally takes the form of a begging gesture, stretching out the hand as a request. This is even the case when the indirect object is first person. In other words, while the direct object is received by the first person, the verb form is produced with a movement away from the signer's body. This is exemplified by the video in Example 4.16 below. In this situation, the signer is discussing a financial conflict with her spouse. She produces the verb GIVE with an outward direction simultaneously with a negative headshake followed by lexical negation to indicate that her husband would not give her money for rice. The key observation is thus that the argument structure of Kata Kolok's transitive predicates is not reflected by their sign-spatial instantiations, and that their sign-spatial forms are counter-intuitive. In other words, they do not follow the patterns of what is generally understood as inflecting in a spatially iconic way.



**Still 4.16** The verb GIVE is produced with an outward direction even when the object is first person

Example 4.16 Non-directional GIVE with first person object

↓ Still 4.16

NM			hs	'pah'
MG	B:i	<b>GIVE</b>	NEG	RICE
ND				

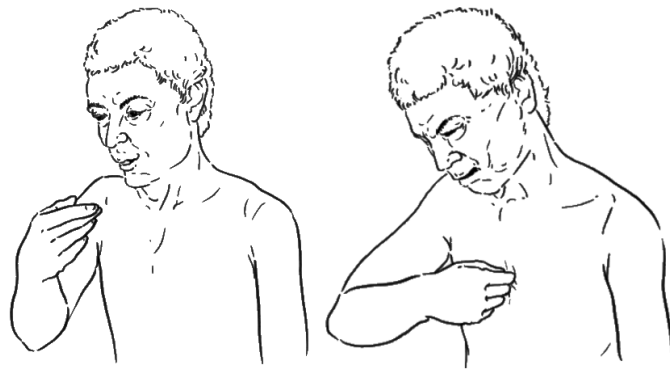
'He wouldn't give me any rice.'

SuPW5jan7\_GIVE\_NEG.mpg

### *Handle classifiers versus directional predicates*

The act of giving is a ditransitive event, as it has three arguments: the subject, the object, and the indirect object. In Kata Kolok such an event can be indicated by using the lexical sign GIVE, which means 'to give,' 'to request,' or 'to receive'. While the same form is used for all three meanings regardless of who the subject and object are, the form is essentially underspecified without a context. Sign languages have an additional structure devoted to ditransitive events: handle classifiers (see also section 4.5.2). Unlike the general verb GIVE, handle classifiers

encode information about the indirect object by the way that the object is normally handled. This contrast is illustrated in Example 4.17, where the signer modifies a handle classifier in order to refer to a person who is behind the camera at the time of the recording. The example stems from a narrative about an occasion in which the signer would like a drink, but has no money. Although he is embarrassed, he decides to ask a person for some money to buy the drink. To indicate his request, he uses the lexical sign GIVE. His friend kindly gives him the money and he is able to buy the drink and finish it. The person who gave him the money is behind the camera at the time of the recording. The event of the person giving him the money is indicated by a handle classifier (with a bunched handshape) going from the direction of the camera, towards the signer's own chest. The direction of the handle classifier is indicated in the gloss by the use of 'x>i'; from person 'x,' to first person 'i'. Still 4.17 presents the initial and final frame of this movement. Note that the handle classifier takes a different handshape depending on the indirect object, while the verb GIVE does not encode such information, and that the sign-spatial movement of the handle classifier reflects the transitive event, while the lexical sign GIVE does not.



**Still 4.17** Directionality in handle classifier



Example 4.17 GIVE versus handle classifier conveying ‘giving event’

NM

MG EMBARRASSED **GIVE** IX‘person X’ TEN-THOUSAND ONE

ND

‘I felt embarrassed, but I requested ten thousand rupiah from this guy.’

↓ Still 4.17 ↓

NM

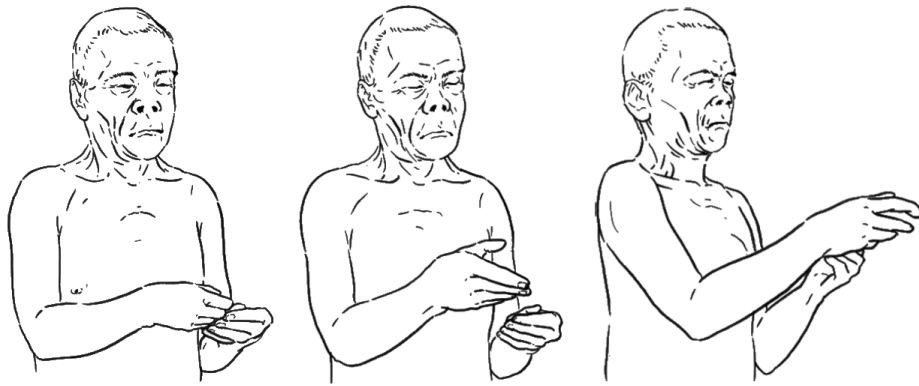
MG IX‘person X’ **Hand-CL:A‘money’x>i** IX‘bottle’ DRINK GOOD

ND

‘He gave it to me and I drank the bottle and that felt good.’

PndGardenChaD3\_handleclassifier\_A.mpg

Handle classifiers can also be used with the distributive aspect marker described in section 4.7.3. In Example 4.18 a signer is discussing his experience of gambling at a cock fight. After the fight between the roosters had finished, he took the money and distributed it among the winners. The distribution of the money is described by a handle classifier with the bunched handshape being produced at several locations in the signing space. The production of the handle classifier with the distributive aspect marker parallels agreement verbs because it is directed towards the direct object of the transitive action. However, regular agreement verbs only take two rather than three arguments, and need not be concerned with the handling of physical objects in the way that handle classifiers are.



**Still 4.18** Handle classifier marked with distributive aspect

Example 4.18 Handle classifiers can be marked with distributive aspect

↓ Still 4.18 ↓ ↓

NM 'pah'

MG FINISH POCKET-MONEY **Handle CL:bunched hand'money'#DISTR**

ND

'(After the cock fight had) finished, I took the money and distributed it (to the winners).

KK-IntheHutDn\_handleclassifierDISTR.mpg

*Directedness in simultaneous classifier constructions*

A final type of directional construction, which is distinct from agreement verbs, is the use of entity classifiers that are meaningfully directed in space. Kata Kolok has two lexical predicates for referring to the act of 'looking' or 'seeing'. The most common way to indicate looking is to produce a pointing sign that is held in the signing space, while a signer enacts demonstrative 'searching' behaviour. The

second way to convey seeing is by a lexical pointing sign that also means EYE.<sup>43</sup> In the Man and Tree data set, however, a different structure that conveys facing information occurred. In the Man and Tree data set, signers were asked to describe the relative position and orientation of two miniature objects, so as to instruct their interlocutors to recreate these arrays.<sup>44</sup> In the description of these stimuli, signers sometimes directed lexical predicates in the signing space, e.g. when describing a scene with two men facing each other. I refer to these constructions as directional predicate constructions; section 11.2.3 addresses them in detail.

#### 4.8.3 Body-anchored verbs

This section presents new evidence that Kata Kolok has a restricted class of verbs that are modified spatially depending on the patient of a transitive event provided that the event concerns physical contact. This additional verb class includes: BE-HIT, KICK, SHAVE, MASSAGE, STROKE, SCRATCH, CUT, etc. Unlike true agreement verbs, they do not depend on a previously established locus in the neutral signing space, but are produced on the signer's body. The sign CUT, for instance, is articulated to indicate the body part that got injured. Similarly, the sign KICK can be produced on any body part that could be hurt. The directional movement of these verbs ends at the signer's body, and I therefore call them body-anchored verbs. These body-anchored verbs show a close resemblance to spatial verbs rather than to agreement verbs. That is, as with spatial verbs, the place of articulation in body-anchored verbs is determined by a concrete spatial location - a bodily location, in the case of body-anchored verbs. The fact that these predicates are produced on various locations on the body complicates a strict morphological analysis. Chapter 5 discusses this aspect of sign-spatiality more generally.

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<sup>43</sup> See section 14.5 for more information on lexicalised pointing signs, including body part indications.

<sup>44</sup> Part IV of the thesis deals with the Man and Tree data set in detail.

Interestingly, the verb BE-HIT also has an active counterpart which iconically depicts the act of hitting someone, rather than being hit. Strikingly, this distinction is also found in structures described in early cohorts of Nicaraguan Sign Language users (Senghas, Coppola, Newport, & Supalla 1997) as well as Al-Sayyed Bedouin Sign Language users (Sandler et al. 2005). Furthermore, all three sign languages use identical structures to describe these types of events by using a noun-verb-noun-verb construction, where the first noun is the agent of the action and the second is the patient; and the first verb describes the event from the perspective of the agent, while the second describes the event from the perspective of the patient. A fight, for instance, might be described as in Example 4.19.

Example 4.19 NVNV structure with body-anchored verbs

NM

MG SIGN-NAME'SK' HIT SIGN-NAME'PN' BE-HIT

ND

'SK Hit PN.'

Nicaraguan Sign Language developed a class of agreement verbs within 30 years, but Kata Kolok and Al-Sayyed Bedouin Sign Language have not. The relationship between these cross-linguistic findings and what they might tell us about the development of spatial verb inflection in sign languages are discussed in the section below.

#### 4.8.4 Verb inflection and time depth

Sections 4.8.1 focussed on one particular feature of Kata Kolok: the lack of spatial modification of transitive verbs. As mentioned, this feature has also been reported for Al-Sayyed Bedouin Sign Language. Sandler et al., in describing the absence of verb inflection in Al-Sayyed Bedouin Sign Language, state that:

"Once languages have had time to accrue such mechanisms as verb agreement, marking properties of subject and objects, or case marking on nouns to indicate their relation to the verb, the role of participants can be made clear even without consistent word order. In the absence of such mechanisms, word order is the only way to disambiguate a message linguistically."

Sandler et al. 2005: 2665

This quote in particular elucidates the hypothesis that time is a key factor in the development of systematic linguistic structure. We might thus put sign languages on a timeline, with emerging sign languages, including village sign language exhibiting fewer linguistic complexities than established, urban sign languages. One of the methodological issues in testing Sandler et al.'s hypothesis is that, while village sign languages are believed to have developed from scratch, urban sign languages can often be traced back to older branches of a sign language family. Old French Sign Language developed after the establishment of formal deaf education in Paris at Abbé de l'Épée in 1755 (Lambert 1865 cited by Woodward 1978), and is believed to be a precursor of many sign languages, including American Sign Language, Danish Sign Language, and the present French Sign Language (Woodward 1978). Another example is Israeli Sign Language, which is often said to be 70 years old, its emergence linked to the establishment of the state of Israel (Meir & Sandler 2008). However, there are some indications that this language borrowed lexical signs from German Sign Language (Meir & Sandler 2008). Because of this, the possibility that some of the structures in Israeli Sign Language stem from German Sign Language, or others, cannot be eliminated. Therefore, when we seek to compare the ages of urban sign languages with those of village sign languages, we do not have an equal calibration point. Urban sign languages form sign language families with multiple languages originating from a common form. Moreover, some urban sign languages are creoles, which have adopted parts of their lexicon and grammatical structures from substrates. For these reasons, the comparison of the age of village sign languages and urban sign

language is often problematic, but with those caveats we can nonetheless compare the age of Al-Sayyed Bedouin Sign Language, Kata Kolok, and Nicaraguan Sign Language.

Section 2.5 has concluded that Kata Kolok is most likely to be in its fifth generation. If this is true, it means that Kata Kolok is not much older than Al-Sayyed Bedouin Sign Language, which is estimated to be 70 years old. Neither language has spatial verb agreement, while we already know that Nicaraguan Sign Language developed spatial verb inflection within three decades (Senghas et al. 2004). It is thus unlikely that time depth is the only factor involved in the emergence of spatial verb inflection on transitive verbs (cf. Sandler et al. 2005). One of the differences between the emergence of Nicaraguan Sign Language and Al-Sayyed Bedouin Sign Language is the proportion of children involved in the creation of the sign language (Senghas 2005). All in all, it seems that, at present, multiple viable hypotheses may be formulated in relation to the characteristics of village sign languages or emerging sign languages, and this issue is pursued further in section 16.2.

#### *4.9 Constituent order*

The present section presents an overview of constituent orders in spontaneous Kata Kolok discourse. Section 4.9.1 reveals that, despite previous reports by Marsaja (2008:168), constituent order plays a negligible role in marking subject and object in spontaneous discourse. Furthermore, the analyses in sections 4.9.2 and 4.9.3 bring to light differences in the constituent orders of Kata Kolok and spoken Balinese. The latter findings are of particular interest as most Kata Kolok signers are bilingual in these languages. It might have been expected that this bilingualism would lead to convergence in constituent order in the languages, but this appears not to be the case.

#### 4.9.1 Constituent order in transitive sentences

The fact that Kata Kolok makes little use of sign-spatial modification of transitive verbs raises the question of how core arguments may be syntactically marked. There are various known linguistic mechanisms that can be used in this domain, and verb inflection is only one of them. Marsaja (2008:168) suggests that Kata Kolok uses strict SVO constituent ordering to mark subject and object. The examples below, from Marsaja, illustrate this. However, Marsaja's analysis was based on linguistic elicitation and grammaticality judgements and had not been checked with actual stretches of discourse. Contrary to Marsaja's observations, the data from Kata Kolok transitive clauses in spontaneous discourse, which I will describe below, suggest that constituent order plays a minor role in the identification of the subject and object of a transitive clause.

Example 4.20 'You tell me' (from Marsaja 2008:168)

YOU TALK ME

'You tell me.'

Example (8a) Marsaja 2008:168

Example 4.21 'I tell you' (from Marsaja 2008:168)

ME TALK YOU

'I tell you.'

Example (8b) Marsaja 2008:168

In order to assess Marsaja's (2008) observation that strict constituent order may mark subject and object, I randomly selected five one minute stretches of spontaneous discourse from five deaf, native Kata Kolok signers. Four of these stretches stem from dialogue conversations and one stems from a monologue narrative. Topics ranged from gossip to a story about Bali's colonial history. In

these stretches of discourse, all predicates and their overtly expressed arguments were identified. Transitive and intransitive verbs were distinguished based on whether the verb could potentially take an object. For instance, EAT was analysed as a transitive verb because it can take a complement, e.g. BANANA EAT ‘eat a banana’. A typical example of an intransitive verb is SLEEP, which never selects for an object. This initial coding step resulted in 98 verb phrases: 61 transitive verbs and 37 intransitive verbs. For each of the transitive verb phrases, the number of overt arguments was counted, and their orders were identified. The results are presented in Table 4.8. The agents of these transitive verb phrases are indicated by S, the patients by O.

TRANSITIVE VERB PHRASES	NO. OF OCCURRENCES	%
Both arguments dropped	40	(66)
One argument dropped	12	(20)
SV	3	
VO	4	
VS	2	
OV	3	
Both arguments expressed	9	(15)
SVO	3	
SOV	3	
OVS	3	
TOTAL	61	(100)

**Table 4.8** Constituent order in transitive Kata Kolok verb phrases  
(figures in brackets are percentages of the selected set of verb phrases)

As shown in Table 4.8, in 66% of transitive predicates that occurred in this data, both the subject and object are absent. These percentages are striking because they



mean that 66% of the transitive sentences have no constituent order. Therefore, constituent order cannot be a reliable clue for interlocutors to identify ‘who did what to whom’. Furthermore, in 20% of the cases, either the subject or object argument is dropped. These sentences, which contain only one argument, are potentially ambiguous as both cases with only the external argument, and cases with only the internal argument, exist in the data set. Finally, I have identified nine utterances in which both the subject and object are overtly expressed.

If Kata Kolok uses strict SVO constituent order to identify the core arguments of a transitive clause, the dominant order in the nine Kata Kolok utterances that contain both a subject and an object should follow this pattern. However, the results in Table 4.8 show that in Kata Kolok sentences with both the subject and object overtly expressed, the constituent order is equally distributed between SVO, SOV, and OVS. The latter word order is particularly surprising because it is a rare constituent order from a cross-linguistic perspective (Dryer 2008).

What motivates constituent order in Kata Kolok transitive sentences? Although there are only a limited number of examples, it does not seem that Kata Kolok signers have idiosyncratic preferences with respect to constituent order. One of the examples of OVS sentences concerned an animate agent and an inanimate object (see Example 4.22). The sign GOOD functions as a possessive marker as described by Perniss and Zeshan (2008). In this sentence, the semantics of the signs, and the animacy of both arguments in particular, could have licensed OVS order. That is, because ‘money’ cannot be the agent of a giving action this alternative interpretation does not occur. In other words, constituent order is not required to disambiguate this sentence.

Example 4.22 GIVE

NM

MG MONEY GIVE BOSS NOT-YET

ND

'(My) boss hasn't paid (me) yet.'

There is also one example of a sentence with OVS word order where the subject was referred to by a pronoun while the object was referred to by a nominal (see Example 4.23 below). Here too, the arguments could be placed on a referential hierarchy, with the (first person) pronoun being more prominent than the noun. Such a pattern is common in many languages around the world (Comrie 1989), and this analysis can also be united with Marsaja's claim. To Kata Kolok interlocutors, constituent order is a marginal cue to argument structure, however, because arguments are sporadically expressed, and word order may only be relevant when the subject and object are of equal prominence.

Example 4.23 OVS constituent order

NM

MG WOMAN GOOD ME

ND

'I have a woman.'

4.9.2 Position of negation

Kata Kolok negation is indicated by a side-to-side waving 5-hand. In addition to the use of this manual sign, there are two optional non-manual markers: a side to side headshake and a negative facial expression involving furrowed brows and pulled-down sides of the mouth. These non-manual signals cannot be used for negation independently of the manual sign (Marsaja 2008:225-227). The manual negation sign and the facial expression are illustrated by Figure 4.15.



**Figure 4.15** Negation

In Kata Kolok, manual negation usually follows the predicate which it negates. As illustrated by Example 4.24, these sentences do not require the non-manual negation components.

**Example 4.24** Predicate-negation

NM

MG WHAT-CAN-YOU-DO BOSS POLICE CATCH FALL

ND NEG

‘What could the police do then? They couldn’t arrest the truck driver because someone had fallen and was injured.’

Gta6oct7 predicate\_negation.mpg

In rare instances, manual negation is produced before the predicate; in these cases the non-manual negation may spread across the sentence (see Example 4.25). More research is needed to assess whether syntactic conditions govern the spread of the non-manual negation marker and if so, which.

Example 4.25 Negation-predicate

NM	hs + ml	
MG	ME	NEG OFFSPRING NEG OFFSPRING
ND		

'I wasn't born yet.'

Gta6oct7\_negation\_predicate.mpg

### 4.9.3 Noun phrases

Pronominal pointing signs that are used to indicate possession in Kata Kolok can either precede or follow the noun (Perniss and Zeshan 2008). Perniss and Zeshan illustrate this by the examples repeated below.

Example 4.26 Noun-possessive pronoun

MOTHER IX'person X'  
'his/her mother'

Example (1) Perniss and Zeshan 2008:132

Example 4.27 Possessive pronoun-noun

IX'person X' MOTHER.  
'his/her mother'

Example (2) Perniss and Zeshan 2008:132

In Kata Kolok, most signs that function as nouns are also employed as adjectives or predicates. This complicates the analysis of adjective-noun order as it is not always clear which of the signs should be considered to be the noun, if any. Nevertheless, there are some examples that show that the modifier can either precede or follow the noun it modifies. The signer of Example 4.28 is discussing a deaf ghost. He states that the ghost's deaf parents also use sign language. The sign DEAF, which here functions as a modifier, follows the nouns MOTHER and FATHER.

Example 4.28 Noun-adjective

NM

MG MOTHER DEAF FATHER DEAF SAME + + + TALK

ND

‘(The deaf ghost’s) deaf mother and deaf father are the same; (they) sign.’

Gta6oct7\_noun\_adjective.mpg

Example 4.29 stems from a stimulus description of the Man and Tree game describing a picture with a red and blue ball. In this example the colour signs RED and GRUE ‘grue’ precede the use of the entity classifiers indicating the shape and location of the balls. Although both orders are valid, there seems to be a preference for adjectival modifications to precede a noun in Kata Kolok. This is notable especially since this order is ungrammatical in spoken Balinese (Arka 2003).

Example 4.29 Adjective-entity classifier

NM

MG GRUE CL:s‘round’

ND RED CL:s‘round’

‘There is a red ball and a grue ball next to it.’

MTJS4mar8\_adjective-noun.mpg

A third and final aspect of the order of heads and modifiers in noun phrases is the case of number. The cardinal number may either precede or follow the noun it quantifies. Furthermore, in some cases, the cardinal number is repeated before and after the noun. The Noun-Numeral order is most frequent in Kata Kolok. In Example 4.30 a signer responds to the question of how many cattle he has. He has three cows; all three are females. He uses the repeated order, the cardinal number before and after the noun (THREE COW THREE), and the numeral following the

noun (FEMALE THREE). Both of these orders are ungrammatical in spoken Balinese (Arka 2003). Like other sign languages, Kata Kolok also allows instances where the cardinal number is incorporated into the lexical sign (see section 4.3 on numeral incorporation).

#### Example 4.30 Position of cardinal numbers

NM			<u>nod</u>
MG	THREE COW THREE	B:i	THREE COW THREE
ND		IX 'there'	

'I have three cows there, really.'

NM  
MG FEMALE THREE  
ND  
'All three are female.'

KK-InthehutDn1\_noun\_numeral.mpg

#### 4.9.4 Kata Kolok and Balinese constituent orders

One of the core typological properties in which languages may differ is the basic constituent order that they display - the order of subject and object with respect to the verb, the order of nouns and their modifiers, etc. The present section discusses a subset of constituent orders of Kata Kolok (as presented in section 4.9) and Balinese (based on Arka 2003; 2005) for which information was available. Table 4.9 presents an overview of the constituent orders of both languages. Four domains of constituent order are addressed: the order of modifiers, and numerals with respect to the noun, negation with respect to the predicate, and subject and object with respect to the predicate. Ungrammatical orders are marked by an asterisk and the prevalent orders are in bold script.

Four differences between both languages can be identified. First, Kata Kolok has more flexible constituent order than Balinese in the sense that it allows for more orders in all four examined ordering patterns. Second, the orders for modifier-noun, numeral-noun, and negation-predicate that are most frequent in Kata Kolok (in bold) are ungrammatical (marked by the \*) in spoken Balinese. Finally, there are two differences between the languages with respect to the order of subject and object in relation to the verb. In spoken Balinese SVO is the dominant pattern, while in Kata Kolok no statistically significant order has been established (see Table 4.8 on p. 139). Furthermore, while in both language subjects are frequently dropped, only Kata Kolok allows the omission of objects (see Table 4.8). These findings provide further support the observation that Kata Kolok and Balinese show no evidence for contact-induced convergence.

	KATA KOLOK	BALINESE (Arka 2003; 2005)
MODIFIER-NOUN	<b>Modifier-Noun</b>	*Modifier-Noun
	Noun-Modifier	Noun-Modifier
NUMERAL-NOUN	<b>Noun-Numeral</b>	*Noun-Numeral
	Numeral-Noun	Numeral-Noun
	Numeral-Noun-Numeral	*Numeral-Noun-Numeral
	Numeral incorporation	*Numeral incorporation
NEGATION-PREDICATE	<b>Predicate-Negation</b>	*Predicate-Negation
	Negation-Predicate	Negation-Predicate
CORE ARGUMENTS	SVO	<b>SVO</b>
	SOV	*SOV
	OVS	OVS
		*OSV

**Table 4.9** Constituent order in Kata Kolok and Balinese  
(Ungrammatical orders are marked by an asterisk and prevalent orders are in bold script.)

In the analysis of Kata Kolok above, subjects have been equated with agents and objects with patients. It should also be noted that, in the case of spoken Balinese, the order of the thematic arguments varies depending on the predicate. In active voice, the undergoer roughly equates with the object and the order is Agent-Verb-Undergoer. In undergoer voice, where the undergoer is a subject, the dominant pattern is Undergoer-Verb-Agent. Hence, when the subject is dropped, the remaining constituent orders in Balinese are Verb-Undergoer (in active voice) and Verb-Agent (in undergoer voice). Unlike Balinese, verbs are not morphologically marked for voice in Kata Kolok, but how does our understanding of constituent order patterns in these two languages change when we take thematic roles rather than syntactic roles into account? The table below presents the attested constituent orders in Kata Kolok and Balinese, with the prevalent orders in bold script. Agents are indicated with a capital A, and patients and undergoer roles are indicated by P. As becomes clear from this overview, Kata Kolok allows verb-final orders, while spoken Balinese does not. Specifically, AV, PV, and APV orders are attested in Kata Kolok, but are ungrammatical in Balinese. All in all, it appears that the constituent orders of spoken Balinese have not influenced this basic typological feature of Kata Kolok.

CORE ARGUMENTS	KATA KOLOK	BALINESE (Arka 2003; 2005) <sup>45</sup>
	AVP VP AV	<i>Active Voice</i> <b>AVP</b> VP *AV
	PVA PV VA	<i>Undergoer Voice</i> PVA *PV VA

<sup>45</sup> I would like to thank Shiohara Asako at the University of Tokyo for explaining some of the details of the Balinese voice system (p.c. 9 January 2012).



	APV	*APV
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**Table 4.10** Core arguments in Kata Kolok and Balinese  
(Ungrammatical orders are marked by an asterisk and prevalent orders are in bold script.)

#### 4.10 *Summary and discussion*

This chapter has presented an overview of a number of structural aspects of Kata Kolok. Section 4.2 listed the handshapes used in Kata Kolok, and these handshape codes are used in glosses throughout the thesis. Section 4.3 sketched some general characteristics of the Kata Kolok lexicon in relation to the spoken Balinese lexicon. An overview of the domains of kinship and colour reveal differences between both languages, and this may prove to be common across spoken languages and their respective sign languages in village communities. Section 4.4 introduced the concept of numeral incorporation and the lexical signs in Kata Kolok that attain this type of morphology. Section 4.5 described the notions of entity classifiers and handle classifiers. Entity classifiers and the simultaneous classifier constructions that they form are of particular relevance to Part IV of the thesis, on Frames of Reference. Section 4.6 presented one aspect of non-manual syntax in Kata Kolok: the use of a general intensifier. Section 4.7 described three aspectual markers; the completive aspect and negative completive aspect marker are of particular relevance to chapter 8 on temporal inference. Section 4.8 addressed one of Kata Kolok's most peculiar features, the absence of spatial verb agreement. Section 4.9 showed that Kata Kolok has an extremely flexible constituent order, and that constituent order is an unreliable cue to identify the subject and object of transitive constructions.

As Nyst (2007a) notes, sign linguistics has thus far focused on urban sign languages, while the study of non-canonical sign languages, including village sign languages, has not received as much attention. The discussion presented above

shows that this may be changing. One crucial area of interest to sign language typologists has become the various ways in which the signing space is used across village sign languages (Zeshan 2010). For example, Adamorobe Sign Language has been found not to use entity classifiers, where handshapes represent semantic classes of entities with verbs of movement (Nyst & Perniss 2004; Nyst 2007a:195). Kata Kolok does deploy a classifier system, but it seems to have a more restricted set of handshapes than other (urban) sign languages (see 4.5.1 for more information). It could therefore be the case that village sign languages employ entity classifier constructions less frequently, if at all. Another aspect of spatial language that has been of cross-linguistic interest is the extremely limited use of spatial marking in transitive verb. It should be noted however that here, too, counterexamples exist: both Adamorobe Sign Language and Inuit Sign Language have limited paradigms of verbs that use this kind of spatial morphology (Nyst 2007a:158; Schuit et al. 2011). It remains unclear as to what causes this distinctive shared pattern between Kata Kolok and Al-Sayyed Bedouin Sign Language, but both Adamorobe Sign Language users and Inuit Sign Language users have had extensive contact with American Sign Language, and it might be that they have developed such strategies in response to this exposure. There is, at present, no detailed analysis of any village sign language available with respect to the domain of sign-spatiality. This thesis therefore presents a first step in exploring the signing space as a domain of typological variation with respect to spatial and non-spatial functions as described above. The issue of which factors may determine the development of sign-spatial structures in sign languages is discussed in section 16.2.

## ***PART III SIGN-SPATIALITY AT THE DISCOURSE LEVEL***

Sign-spatial mapping constitutes a diverse range of phenomena that can and should be analysed at different levels of linguistic structure. Part III coins the term ‘sign-spatiality’ to delineate the specific type of sign-spatial mapping which this thesis deals with: the ways in which signers systematically employ the degrees of spatial freedom of signs to indicate meanings that are ultimately resolved by the interplay between discourse and grammar. Based on a comparison of sign-spatial structures in Kata Kolok and other sign languages, it is shown that the use of sign-spatiality in Kata Kolok discourse is largely limited to absolute spatial reference. This observation leads to the description of alternative, non-sign-spatial structures that are used in Kata Kolok in the domains of person and time reference. It appears that, here too, Kata Kolok’s referential structures are primarily resolved by extra-linguistic elements, and it is hypothesised that this system may be facilitated by the dense social networks within the signing community.

## 5 *Sign-spatiality*

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### 5.1 *Overview*

The gestural modality allows the inscription of the articulatory signing space with meanings in a way unparalleled by speech (but available in co-speech gesture), because it relies on the spatial features of signs. This thesis has used the term ‘sign-spatial mapping’ as an umbrella concept that brings together all the ways in which the signing space becomes inscribed with meaning. While all forms of sign-spatial mapping contain some element of iconic motivation, it is argued that sign-spatial structures form a diverse set of phenomena, which can and should be analysed at different levels of linguistic organisation. Section 5.2 therefore introduces the narrower concept of ‘sign-spatiality’: systematically recruiting the degrees of spatial freedom of signs, by locating, orientating, and directing them to indicate meanings that are ultimately determined by the interaction of grammar and discourse. Sign-spatiality is used in numerous domains of the language, and Part III addresses the use of sign-spatiality at the discourse level. Sections 5.3 and 5.4 serve to introduce the key theoretical notions, common to both signed and spoken languages, that underlie the referential functions of sign-spatiality.

### 5.2 *Sign-spatial mapping: various levels of structural organisation*

The overview presented in section 1.4 made clear that sign-spatial forms are used to express a variety of meanings in the domains of space, person and time. In the history of sign linguistics, these forms of spatial iconicity have been analysed in various ways. The sign-spatial mapping of classifiers in American Sign Language was originally treated as a form of mimetic depiction, that is to say, holistic imagery, but in later publications these sign-spatial structures are analysed at the morphological level (Klima & Bellugi 1979; Supalla 1978, 1986). In early treatments of American Sign Language, for instance, the sign-spatial manifestation

of classifiers - verbs of motion in Supalla's (1986) terminology - is characterised as morphemic in nature, on a par with the spatial morphemes in spoken languages:

"...ASL verbs of motion, like words of spoken languages, are composed of combinations of discrete morphemes; and [...] the morphological parameters and grammatically possible values along these parameters are like those found in spoken languages of the world."

Supalla 1986:182

Supalla (1986:205) continues by providing examples of how American Sign Language users combine these spatial morphemes to make numerous constructions, for example VEHICLE-ROTATE-ON-HORIZONTAL-WIDE-STRAIGHT-SHAPE, LONG-VERTICAL-THIN-STRAIGHT-SHAPE-SWING-TO-HORIZONTAL, or PERSON-FALL-FROM-VEHICLE. A similar view is adopted by Engberg-Pedersen when she summarises the characteristics of what are called "polymorphemic verbs" in her description of classifier constructions in Danish Sign Language:

"...a prototypical morphemic verb does not have a lexically specified movement. Rather, it can take a number of morphemes that express motion, state, of being located, manner, distribution, and locative relations."

Engberg-Pedersen 1993:309

As Liddell (1995) points out, however, a morphological analysis of these kinds of mappings leads to a infinite number of morphemes, due to the indefinite degrees of freedom that sign-spatial forms offer. The question thus arises as to whether signers put these gradient affordances of the gestural modality to use, or whether they in fact describe and perceive spatial relations categorically, on a par with spoken languages. Emmorey and Herzig (2003) have approached this question experimentally by asking American Sign Language users to describe pictures

featuring a dot and a line, which were drawn at varying distances from one another. The simultaneous classifier constructions that featured in these descriptions indeed map the spatial relations of the stimulus pictures onto signing space in an analogue manner. Moreover, in the perception task that followed, both signers and non-signers did not group these sign-spatial expressions together as equally good descriptions of a specific spatial relation between the dot and the line. These results thus corroborate Liddell's (1995) hypothesis that American Sign Language users do not partition the signing space along strictly delineated spatial morphemes in either production or perception. It should be noted, however, that the tasks developed by Emmorey and Herzig (2003) systematically contrasted minute differences in spatial relations, and for this reason, the participants may have been prompted to make these analogue distinctions due to the artificial nature of the task. It would in fact appear cognitively rather taxing if sign language users adopted this gradient strategy continuously. The issue of which sign-spatial information is taken to be relevant within specific contexts is considered in Part IV of the thesis. At any rate, Emmorey and Herzig (2003) have shown that signers can use and understand sign-spatial structures in an analogue manner with great detail, and because of their inherent gradience we cannot assume that the meanings that arise from sign-spatial mapping are morphemic in nature.

In her description of temporal reference in Danish Sign Language, Engberg-Pedersen highlights the fact that sign-spatial mappings are in fact best interpreted at different levels of structural organisation. Specifically, Engberg-Pedersen sets apart morphological ("lexemic") uses of timelines as opposed to timelines with a discourse function (1993:81). The Danish Sign Language lexicon, for example, lists various signs that reflect a timeline and in these cases the spatial characteristics of signs have received fixed meanings, for example LAST-YEAR and NEXT-YEAR (Engberg-Pedersen 1993:84). As was explained in section 1.4.3, such systematic oppositional pairs are common to other signed languages as well.

Engberg-Pedersen (1993:84-89) focuses on timelines that are resolved within spontaneous discourse. The key observation is that by placing lexical signs at different loci in the signing space, they become invested with meanings that only exist for the duration of the particular discourse. There are two related ways in which these temporary, temporal meanings are ascribed to the signing space. First, by producing the lexical sign at the same locus, the events represented by that locus are taken to occur within the same moment in time. Sign-spatial contiguity thus indicates temporal contiguity. Second, the signing space becomes inscribed with derived temporal meanings: the loci that precede or follow on the designated timeline are taken to indicate the temporal relationships between events.

Engberg-Pedersen (1993:84-89) describes multiple timelines, including the anaphoric timeline which runs towards a spatially fixed reference point in the signing space in front of the signer. Engberg-Pedersen (1993:85-86) illustrates the anaphoric timeline with an example of spontaneous Danish Sign Language use. In this narration, the signer describes the meetings leading up to the annual assembly of the National Association of the Deaf, which is represented by the fixed reference point front of her. In describing the preceding meetings, the signer produces the signs GROUP and DISCUSS along an imagined timeline between her chest and the reference point to indicate that several groups had discussed the objectives of the assembly in several meetings leading up to the event. Notably, while sign-spatial timelines are always potentially available, the signer activates a temporal frame by producing the signs on a timeline in the signing space.

As argued by Zeshan (2000:121-123), the meaning that is added, even temporarily, through the placement of lexical signs in the signing space, cannot be analysed in morphosyntactic terms. These structures are not a requirement of the grammar, and the temporal meanings that are evoked through the activation of a timeline can only be resolved at the discourse level. It is not the case that any sign produced in the signing space receives an additional temporal meaning. Rather,

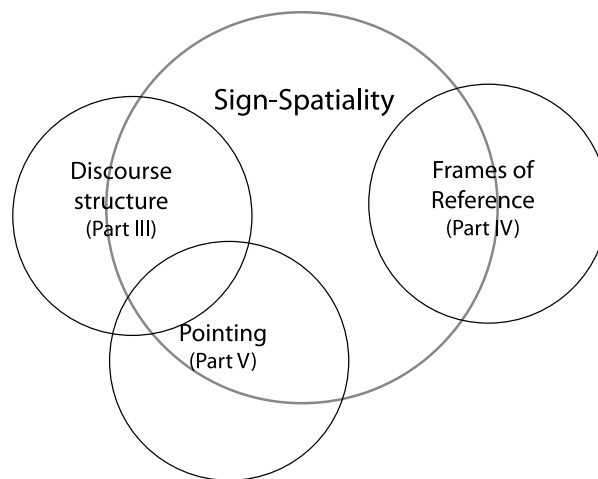
through diagrammatic placement of these lexical signs within the discourse an additional, temporal meaning arises. Conversely, as in the case of lexical signs such as LAST-YEAR and NEXT-YEAR, this temporal inscription of the signing space appears to have fossilized, because it is recognisable outside a discourse context, and should be considered morphemic as such. The sign-spatial mapping from temporal relations onto the signing space is thus not homogeneous, and these ascribed meanings are best analysed at different levels of structural organisation. In the case of lexical items a morphological analysis suffices, while the placement of lexical signs in the signing space to express additional temporal information requires an analysis at the discourse level.

It is this latter level of structural analysis which is of particular relevance to the study of signed languages, because it is directly linked to the affordances of the gestural modality. Signers systematically recruit the degrees of spatial freedom of signs to add meanings that rely on the discourse for their full interpretation. As a result of this, pointing signs, lexical signs, and composite structures of signs acquire variable interpretations through their placement in the signing space. Because of their non-morphemic nature, these types of meanings are taken to be non-linguistic in the work of Liddell (2003). It is important to realise however that a non-linguistic account may not do justice to the full range of sign-spatial structures that a language may display. With regard to the use of spatial verb agreement, for instance, there are several arguments in favour of a morphosyntactic analysis. Spatial verb agreement overtly marks the core syntactic function of linking the arguments to the verb. Moreover, the transitive predicates which can and cannot be modified spatially differ according to the grammatical rules of usage which are unique to a particular sign language (see for example Nyst 2007a:158; Hong 2009; Schuit et al. 2011). As pointed out by Quer (2010), instantiations of spatial verb agreement also interact with the grammars of individual sign languages in numerous domains, including the position of negation in the sentence



and the use of agreement auxiliaries. While the sign-spatial instantiations of agreement verbs are in part governed by morphosyntactic constraints, they are also intimately connected to the discourse context. The loci towards which agreement verbs are directed arise as part of the ongoing process of ascribing co-referential meanings to the signing space. This inherently hybrid nature of sign-spatiality comes to the fore when analysing stretches of spontaneous discourse.

The sections above have argued that sign-spatial mappings constitute a heterogeneous phenomenon which may, in part, transcend morphology. This type of sign-spatial mapping has been named ‘sign-spatiality’: the meaningful placement, orientation, or directing of pointing signs, lexical signs, and composite structures of signs to express meanings that arise through the interplay between grammar and discourse. Figure 5.1 illustrates the functional domains in which sign languages recruit sign-spatiality. Three domains form the core of sign-spatial phenomena in Kata Kolok and each thesis part deals with one of these domains. Part IV focuses on sign-spatiality in relation to Frames of Reference; in Part V, I address pointing signs, which have traditionally been analysed based on their sign-spatial characteristics. The recruitment of sign-spatiality for discourse purposes is addressed in this part of the thesis. The remaining chapters of Part III of the thesis (chapters 6-8) focus on the deictic and anaphoric mechanisms that Kata Kolok signers use to construct coherent discourse in the domains of space, person, and time reference. Before doing so, however, the sections below present a brief overview of the theoretical notions surrounding deictic and anaphoric reference in the literature on signed and spoken languages.



**Figure 5.1** Functional domains dealt with in this thesis

### 5.3 *Sign-spatiality: deixis and anaphora*

Deixis concerns those units of language that either presuppose or encode information about the situational context of the utterance (Silverstein 1976). The full interpretation and appropriateness of a deictic element thus relies on contextual variables such as the identity of the sender or receiver of the utterance, the time at which it was uttered, and the location in which communication took place. Hence, the specific meaning of a deictic sign cannot be determined without access to the Speech Event context.<sup>46</sup> This is most evident in cases in which sufficient context is lacking (Levinson 1983:54). For example, imagine finding a note in the streets that says: 'I'll be back in an hour'. As the reader of this note, you would be able to retrieve part of the information contained in this sentence. Since the first person singular form is used, you would know that only one person has left, and that he or she wrote the note him/herself. However, you could not be certain as to who wrote

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<sup>46</sup> Note that throughout the thesis, "Speech Event" is used as a modality-independent, technical term and can refer to signed, spoken, and written utterances.

the text, nor when and where it was written. Conversely, if you were to find the same note on the kitchen table, in the handwriting of your friend, after you had seen him/her five minutes ago, you would probably not have experienced trouble in coming to a full understanding of the note.

Deictic elements of language are also known as “shifters,” as their references shift under varying circumstances (Jespersen 1922). Two primary notions underlie the shifting semantics of linguistic deixis. Firstly, Bühler (1982 [1934]) observes that all deictic elements have an *origo*, i.e. a ‘here,’ an ‘ego’ and ‘now,’ from which the meaning of the deictic word is calculated. This *origo* need not lie with the speaker; there are languages where this *origo* can lie with either the speaker or the addressee (Levinson 2004). The fact that deictic elements have a flexible *origo* allows them to shift in meaning according to the context of their use. Secondly, Jakobson (1971 [1956]) shows how the calculation of the meaning of a deictic element revolves around the relationship between the *origo* of the Speech Event and the *origo* of the Narrated Event, which may or may not coincide.

The interpretation of a deictic element can rely on the situational context, or (additionally) on the referents that feature in the preceding text. The reference of both kinds of expressions is determined contextually - in the physical space-time context of the Speech Event and in the ongoing discourse respectively (Levinson 2000b:268ff). The first kind of reference is resolved exophorically, the second kind endophorically (Halliday & Hasan 1976). Halliday and Hasan present the example of pronouns that refer to speech act participant roles. Normally, the forms ‘I’ and ‘you’ are identified based on the situational context of the utterance, in other words, based on information exophoric to the linguistic utterance itself. Contrastingly, when these pronouns are used in quoted speech, their meanings must be resolved based on the spoken discourse. In quoted speech the ‘I’ may not refer to the speaker, and for this reason the interlocutor has to retrieve additional cues from the discourse context to determine the referent. In subsequent chapters, it

will become clear that the distinction between exophoric and endophoric reference enables the identification of differences between Kata Kolok and other sign languages. That is to say, Kata Kolok anaphora is dominated by exophoric rather than endophoric reference. In contrast to the anaphoric elements described by Halliday and Hasan, which can in principle function in either way, the sign-spatial properties of Kata Kolok signs disclose whether the signs are to be resolved by reference to the Speech Event or by reference to the Narrated Event (see chapters 6 and 7).

In the literature on sign languages, the concept of deixis has sometimes been used in idiosyncratic ways. Engberg-Pedersen (1993), for instance, uses the term “deictic” exclusively for signs that are *shaped* by their environment in Danish Sign Language:

“If it [the frame of reference] is deictic, the signer points in the direction of the entities or locations in the context of the utterance. Here, the frame of reference is determined by the actual locations of the entities or places to which the signer refers.”

Engberg-Pedersen 1993:71

This definition constrains deixis to a particular subtype of sign-spatial forms that are motivated by locations in the real world. In my view, this narrow interpretation of what constitutes deixis complicates the comparison of signed and spoken deixis. That is to say, it limits deixis to forms that not only refer to contextual information concerning the Speech Event, but that are also directed at objects in the real-world. Within such an analysis the Kata Kolok signs for YESTERDAY, TWO-DAYS-AGO, THREE-DAYS-AGO, and FOUR-DAYS-AGO would all be excluded because they are all produced at the signer’s cheek (see section 4.4). In order to compare signed and spoken language deixis on equal grounds, I therefore do not adopt this formal criterion to identify deictic elements in Kata Kolok. Rather,

deictic elements are solely defined on the basis of the fact that they require extralinguistic information for their reference to be fully understood.

#### 5.4 *The semiotics of sign-spatiality*

Semiotically speaking, deictic elements rely on indexicality for their resolution. I here adopt the term “indexicality” from Peirce (1991).<sup>47</sup> Three types of relations between signs and their meanings are differentiated within the Peircean framework: symbolic relations, iconic relations, and indexical relations. When a meaning for a particular sign arises solely by virtue of a social convention to do so, this is called a symbolic form-meaning mapping. In de Saussure’s classical example, this convention is the only mechanism responsible for the fact that speakers of French call ‘a tree,’ *un arbre*, and speakers of Dutch call it *een boom*. Contrastingly, when signs denote their referents based on a shared quality, this is referred to as an iconic form-meaning mapping. An example of iconicity is the Dutch word *oehoe*, which refers to the world’s most common species of owl. The Dutch name for this species (*Bubo Bubo*) mimics the bird’s call, which is a deep resonant *ooh-hu* with emphasis on the first syllable for the male, and a more high-pitched *uh-hu* for the female.<sup>48,49</sup> Indexical meanings arise from the fact that signs can stand for their referents based on a spatial-temporal-causal contiguity. Within the Peircean trichotomy, which is not restricted to linguistic signs, an indexical form-meaning mapping need not concern a word. Smoke, for instance, can be taken to indicate fire, by virtue of the fact that it spatially coincides with fire, temporally coincides and follows fire, and is caused by fire. Note that within the Peircean trichotomy, this means that indexical relations need not be deictic in the

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<sup>47</sup> For an introduction to Peircean semiotics see Parmentier (1994).

<sup>48</sup> See [http://en.wikipedia.org/wiki/Eurasian\\_Eagle-owl](http://en.wikipedia.org/wiki/Eurasian_Eagle-owl) (accessed May 9th 2011).

<sup>49</sup> Note that onomatopoeia are per definition metonymic and indexical as such; the hybrid nature of iconic-indexicals is addressed from p. 175 onwards.

linguistic sense. The same holds true for iconic and symbolic form-meaning mappings.

As with the term deixis, the notion of indexicality has attained idiosyncratic interpretations in the literature on sign languages. A number of authors (including Liddell 2003:ix), following Klima & Bellugi (1979), do not distinguish indexicality from sign-spatiality, but equate indexicality with the sign-spatial characteristics of pointing signs. I quote Cormier (2007) as an example:

“Indexic signs are those that ‘point to’ a location in space associated with a referent (or referents). Here I define the term indexicality as the extent to which pointing occurs.”

Cormier 2007:64

Cormier subsequently elicits pronominal forms of American Sign Language and British Sign Language based on written English scenarios and charts spatial realisation of pronouns within these retellings. Consider Cormier’s conclusion regarding plural pronominal pointing signs in the American and British Sign Languages below:

“...pronouns are not equally indexic, plural pronouns are less indexic than singulars, and first person plurals are even less indexic than general plurals.”

Cormier 2007:94

According to Cormier, the results thus indicate that signs may be indexical, or ‘point,’ to varying degrees, and that the plural pronominals have, to varying degrees, lost their indexical properties in American Sign Language and British Sign Language. Using the terminology proposed in this thesis, the pronouns would be equally indexical, but their meanings less reliant on sign-spatiality. In the domain of person reference, all forms that are directed at the perceived locations of

referents are sign-spatial, including pronominal pointing signs, agreement verbs, and the use of body shifts to indicate different referents. Conversely, forms that do not adhere to the conceived locations of these referents, but *are* dependent on resolution within the discourse context, are not considered sign-spatial.

The British Sign Language first person plural pronouns described by Cormier (2007) fall into this latter category. Cormier (2007:88) illustrates the use of “non-indexic”, or non-sign-spatial pronominal forms with the exclusive pronoun THREE-OF-US-DISPLACED in British Sign Language. In the example that Cormier presents, this pronominal form is produced directly following a discourse in which two third person referents have been localised in the signing space in front of the signer; the pronoun refers to these two referents as well as the signer him/herself. In this utterance, THREE-OF-US-DISPLACED is produced near the signer’s chest and as such its sign-spatial realisation does not contribute to its interpretation.

### *Semiotic hybrids*

It is important to note that the semiotic mechanisms described by Peirce are not exclusive categorisations and may, in fact, interact. First of all, in a way, all linguistic signs depend on convention, as one needs to know the language to segment the auditory or visual signal into words that signify. In this latter sense deictic elements, too, rely on both symbolic and indexical meaning (Jakobson 1971; Enfield 2009). Furthermore, the use of iconicity is often mediated through conventions. In section 14.5 of this thesis, this becomes clear in the discussion of lexicalised pointing signs, which are symbolic-indexical, and therefore have a partial, stable meaning independent of their context, similar to spoken language pronouns. While having iconic forms, onomatopoeia for the same species of animals differ from one language to the next one, and these cross-linguistic differences also occur among sign languages. Perniss (2007:6), for instance,

presents the signs for 'eagle' in two sign languages. In German Sign Language, the bird's beak is depicted by a hooked shape at the location of the signer's nose. Conversely, in Ugandan Sign Language, the bird's claws are used to refer to the whole bird. In both cases an indexical relationship exists between the sign and the meaning it stands for: a part of the referent is representative of its whole through means of an existential - spatial-temporal-causal -relationship to it. These two signs also show that iconicity interacts with indexicality, as in one case the beak represents the eagle by virtue of an indexical, part-whole relationship; and, in the other case, the eagle's claws indicate the whole bird.

Many of such iconic-indexical-symbolic hybrids can be identified when comparing the lexica of signed languages. In American Sign Language, for instance, the sign for 'milk' is made by a big-C-hand that closes to an S-hand, thus indicating the squeezing movement made by the hand when milking an animal.<sup>50</sup> Conversely, the identical form refers to the root turmeric and cannot indicate milk in Kata Kolok. Both of these signs are iconic as they resemble the physical act of squeezing. In American Sign Language the sign indicates the end-product that results from the squeezing action, while in Kata Kolok the sign refers to the object being squeezed, during the preparation of foods. In both sign languages the sign does not refer primarily to the action itself, but to an object associated with that action through an indexical relation. Importantly, these conventions are entrenched in the local community just like other conventional signs, and they are therefore iconic-indexical-symbolic hybrids.

The Kata Kolok data that are presented and analysed throughout this thesis suggest that, in light of the cross-linguistic differences between sign languages, and despite previous assumptions about the nature of sign-spatiality, sign-spatiality

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<sup>50</sup> See the American Sign Language dictionary at <http://www.lifeprint.com/> (Accessed 12th May 2011)



constitutes a iconic-indexical-symbolic hybrid, too. That is, while being iconically and indexically motivated, there appear to be language-specific conventions to its implementation. This thesis thus emphasises the unique characteristics of sign-spatiality in Kata Kolok, as opposed to previous work on other sign languages, which has high-lighted its universal aspects (cf. Taub 2001; Liddell 2003; Aronoff et al. 2005).

### *5.5 Summary and discussion*

Sign language linguists need to strike a fine balance between acknowledging the affordances of the gestural modality and demonstrating the different levels of structural organisation of sign-spatial mapping. This thesis has identified sign-spatiality as a particular domain of interest. Sign-spatiality constitutes the way in which signers employ the degrees of spatial freedom of signs, by locating, orientating, and directing them to indicate meanings that are ultimately determined by the interaction of grammar and discourse. This thesis deals with three domains in which sign-spatiality is prominent within Kata Kolok: discourse structure, Frames of Reference, and pointing. Sections 5.3 and 5.4 introduced the key theoretical notions, common to both signed and spoken languages, that underlie the referential functions of sign-spatiality. The remaining chapters of Part III focuses on the ways Kata Kolok signers achieve discourse coherence in the domains of space, person and time reference.

## ***6 Spatial deixis in Kata Kolok***

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### *6.1 Overview*

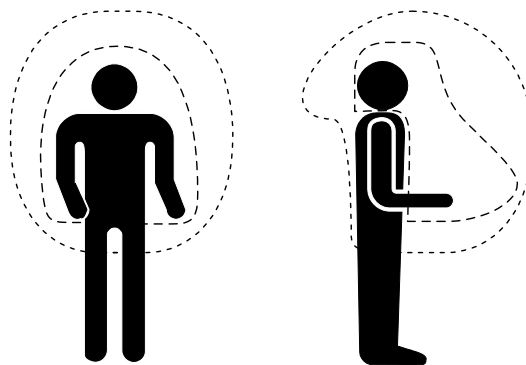
This chapter examines the use of sign-spatiality for spatial-deictic functions. Section 5.3 introduced the distinction between two types of resolution of referential elements: exophoric and endophoric. Exophoric elements refer to the situational context of the Speech Event. Endophoric elements (additionally) refer to information found within the discourse. In spoken languages, identical forms may serve both functions (Haliday & Hasan 1976). It is argued for Kata Kolok, however, that the sign-spatial characteristics of Kata Kolok's signs disclose whether they are to be resolved exophorically or endophorically. In particular, sign-spatial forms produced in the extended signing space are interpreted exophorically, in terms of geographic locations, while sign-spatial forms in the neutral zone of the signing space are resolved anaphorically by the discourse context (section 6.2). The subsequent sections show how this distinction is relevant to the interpretation of the sign-spatial properties of various Kata Kolok spatial-deictic structures. Section 14.2 describes the details of Kata Kolok's pointing signs used for locative functions. This description endorses the finding that, with rare exceptions, pointing signs are motivated by geographic locations within the vicinity of the village (cf. Zeshan 2006a). However, "absolute transpositions" - deictic shifts that rely on the absolute Frame of Reference - are rare and have not been identified for pointing signs that reach outside the neutral signing space. Section 6.4 shows that signers can draw mental maps in the neutral signing space and that these maps may be shifted with respect to cardinal directions, but that their internal logic is systematic. These spatial shifts provide additional evidence of the endophoric potential of the neutral signing space. While pointing signs that exit the neutral signing space are necessarily linked to geographic locations, pointing signs within the neutral signing space may form a map that is shifted with respect to

absolute directions. Section 6.5 introduces a set of general direction verbs that, on the one hand, adhere to geographic locations and, on the other hand, are anchored in the neutral signing space. More specifically, elements of the sign that begin or end in the neutral signing space are interpreted as originating from or ending in the deictic origo. Conversely, elements of the sign that begin or end in the extended signing space - and are directed at geographic locations as such - are interpreted as referring to these geographic locations. When general direction verbs are produced entirely in the neutral signing space, the signer does not commit to geographic locations at all. On the whole, the distinction between the neutral and the extended signing space is crucial to the interpretation of sign-spatiality in Kata Kolok.

## *6.2 The neutral and the extended signing space*

Kata Kolok signers have a reportedly larger articulatory signing space than individuals using urban sign languages (Marsaja 2008:160). Moreover, the sign-spatial characteristics of their spatial signs are predominantly interpreted geographically. Interestingly, two village sign languages, Adamorobe Sign Language (Nyst 2007a:214) and Enga Sign Language (Kendon 1980a) also have a similarly large signing space. Furthermore, in both the size of their signing space, and the dominance of geographic interpretations, Kata Kolok resembles the absolute co-speech gestures reported of Guugu Yimithirr (Haviland 1993, 1998; Levinson 2003) and Tzeltal speakers (Levinson 2003). Levinson (2003:264-6) shows that the co-speech gesture spaces of speakers of languages with a dominant relative Frame of Reference are confined in a similar space to urban signers. This section proposes that there is a positive relationship between the use of large signs in Kata Kolok and their geographical interpretation. Specifically, I propose that a neutral signing space surrounds the signer, and that the production of signs in this area allows Kata Kolok signers to detach sign-spatial forms from a geographic interpretation. The neutral signing space seems to rely on the association of the signer, as the deictic origo, with the space directly surrounding him/her. Figure 6.1

presents a diagram of the neutral versus the extended signing space as viewed from the front and the side. The neutral signing space is indicated by the inner circle, while the extended signing space is shown by the peripheral circle, minus the neutral signing space. These diagrams focus on the designated areas of signing space in which the hands are used, but do not capture the sign-spatial projections of other articulators such as the eyes and lips. Chapter 14 touches upon these non-manual pointing behaviours, but this formal domain remains an underdescribed aspect of Kata Kolok. Importantly, the distinction between the neutral and the extended areas of signing space is not always clear-cut and the two circles nearly connect in the right-hand diagram of Figure 6.1 to indicate this. The contextual resolution of such sign-spatial ambiguities are addressed in the relevant sections in this and other parts of the thesis (see sections 10.3.2 and 11.2.3).



**Figure 6.1** The neutral signing space (indicated by the inner-circle) and the extended signing space (indicated by the peripheral circle) as viewed from the front and the side

Levinson (2003:252f) identifies the different functions of the extreme periphery, the periphery, the centre, and the centre-centre of Guugu Yimithrr gesture space. Levinson's analysis closely resembles the distinction between the extended and

neutral signing space in Kata Kolok. Peripheral gestures are inspected for their full directional interpretation. Conversely, the centre of the gesture space is reserved for specific gestures, including metaphors, counting, downward movement, and reference to one's own body, taboo persons, or conversational asides. Stokoe et al. (1965, cited by Liddell 2000:368) describe 'the neutral place' for American Sign Language. This concept refers to the zero location morpheme that any sign that is not produced on the body attains. To my knowledge, Stokoe et al. do not further differentiate areas of the signing space, and the notion of the neutral signing space referred to here thus constitutes a different concept.

It should be noted that the diagrams in Figure 6.1 are only a schematic representation of the two areas of Kata Kolok's signing space, and additional data are required to determine their exact boundaries. In particular, video recordings from multiple camera angles should be made and analysed in order to identify the edges of each area. Further, while users of urban sign languages usually restrict their signs to the neutral signing space, they also employ the extended signing space for artistic purposes (see Sutton-Spence 2001 on poetry in British Sign Language). More research is needed to determine whether other sign languages reserve certain areas of the articulatory signing space for particular linguistic functions. The following sections elaborate on the distinction between the neutral and the extended signing space as it relates to deictic and anaphoric reference in various sign-spatial forms in Kata Kolok.

### *6.3 Sign-spatial directions of pointing signs*

Perniss & Zeshan (2008) note that the relationship between the absolute Frame of Reference and "absolute" pointing needs fleshing out. A crucial difference between the absolute Frame of Reference and the relative Frame of Reference is that the relative Frame is anchored in a viewpoint, while the absolute Frame adheres to cardinal directions. The same distinction resurfaces, in the comparison between relative and absolute pointing, when a displacement has taken place between the

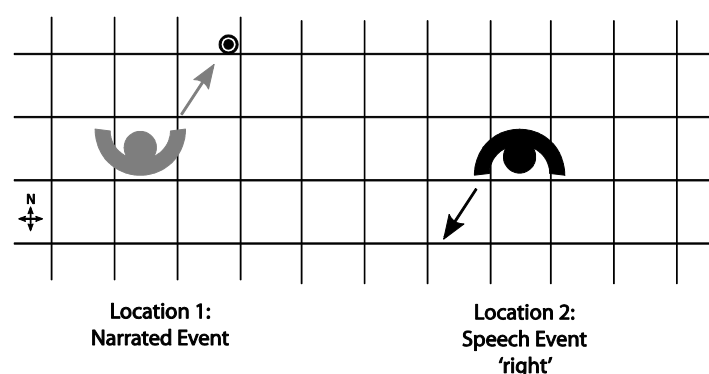
locations of the Speech Event and the Narrated Event. That is, if one is a “relative” coder the direction of the pointing sign remains constant with respect to the orientation of the individual's body. If one is an “absolute” coder, the direction of the pointing sign remains constant with respect to actual geographical locations, but not to the orientation of the signer. This latter type of pointing, referred to here as absolute pointing, is consistent with pointing at actual geographic locations, and based on an extrinsic mental map of the environment. These two canonical options are explicated below. I also show a third option is available, which is a strategy rarely adopted by Kata Kolok signers. In absolute transpositional pointing, the direction of the pointing sign remains constant with respect to an absolute grid, rather than actual geographical locations. Such deictic shifts in absolute pointing signs have also been reported for speakers of languages with a dominant absolute Frame of Reference (Haviland 1993, 1996; Gaby 2006).

The use of relative pointing is illustrated by the diagram in Figure 6.2. The grey figure on the left represents an individual from a bird's eye perspective, and the arrow indicates the direction of the pointing sign to his/her front/right.<sup>51</sup> The arrow is directed towards the individual's right-hand side, and indicates a location, which is denoted by a circled dot. This initial image represents the location of the Narrated Event. In the image on the right a black figure represents the same individual, who is now at a position to the right of the location of the Narrated Event and rotated by 180°. In this case the referent and its location are outside of visual range, as indicated by the absence of the circled dot. In both cases, the direction of the pointing sign remains constant with respect to the signer's body; the sign is to his/her front-right. Relative pointing is the strategy adopted in sign

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51 This symbol, which is used to represent individuals from a bird's eye perspective, was adopted from Boroditsky & Gaby (2010), and designed by Mark Dingemanse. Etymologically, this symbol stems from aboriginal art, in which a U-shape represents individuals, by virtue of the fact that they leave such a mark in the sand when seated (see also Green 2009).

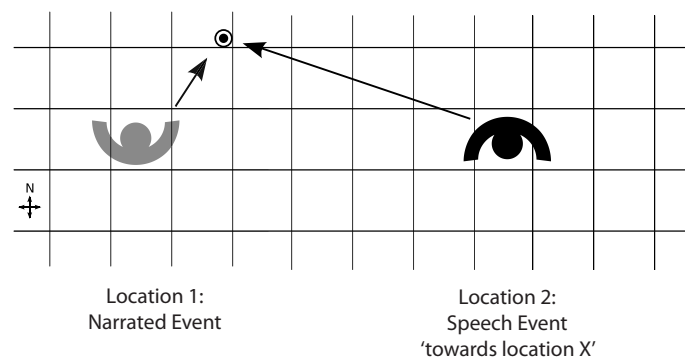
language discourse, when referents are localised in the signing space directly in front of them. These types of localisations were first described in pronominal pointing signs in American Sign Language (e.g. Friedman 1975; Kegl 2003 [1976]), but the phenomenon has been described for many sign languages since; see for instance Ahlgren 1990 on Swedish Sign Language; Engberg-Pedersen (1993:117-139) on Danish Sign Language, and Zeshan (2000:99) on Indo-Pakistani Sign Language. As mentioned in section 1.4.2 Kata Kolok signers do not generally adopt relative pointing, but sections 6.4 and 7.5 provide some counterexamples.



**Figure 6.2** Relative pointing

The pointing strategy adopted by Kata Kolok signers throughout stretches of discourse is different from the option described above. Figure 6.3 illustrates the preferred Kata Kolok strategy: absolute pointing. The grey figure and the grey arrow on the left illustrate an individual who points in the direction of a location (the circled dot). On the right, the same individual has moved and rotated identically to the diagram in Figure 6.2. In this case however, the direction of the pointing sign has not remained constant with respect to the signer's own body, nor

with respect to an absolute grid; rather, the direction of the pointing sign is determined by the geographic location (the circled dot) in each case. It is this second strategy that prevails in the Kata Kolok pointing system.

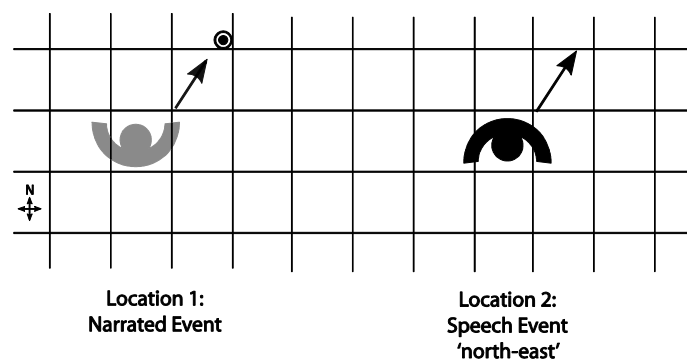


**Figure 6.3** Absolute pointing from the deictic origo

The absolute pointing signs are produced from the deictic origo and require a mental map for resolution. Building on this knowledge of the geographical locations at the cardinal directions of pointing signs, absolute coders can also produce absolute transposition pointing signs which take the origo of the Narrated Event as a vantage point. Figure 6.4 illustrates absolute transpositional pointing. The grey image on the left illustrates a Narrated Event identical to the one in Figure 6.2. The black image on the right represents an individual who is again at a position to the right of the Location of the Narrated Event and rotated by 180°, just like the individual in Figure 6.2. However, the direction of the pointing sign has not remained constant with respect to the individual's body, but with respect to the cardinal direction 'north-east.' In other words, the direction of the pointing sign has remained constant with respect to an absolute grid. This type of deictic shift is called an absolute transposition, because the pointing sign effectively puts the narrator back in the geographical position and location of the Narrated Event.



Absolute transpositions have been reported in the co-speech gestures of speakers of Guugu Yimithirr and Kuuk Thayorre, which are both languages with a dominant absolute Frame of Reference (Haviland 1993, 1996; Gaby 2006). These kinds of deictic shifts in pointing signs are known as “deixis at phantasma” in the work of Bühler (1982 [1934]).



**Figure 6.4** Absolute pointing transposed to the origo of the narrative location

Note that the origos of the relative and absolute transpositional pointing signs above could in principle be computed if one knows the direction of the original pointing sign in terms of a relative or absolute direction. In the case of absolute pointing, however, one needs a map of the location of the Narrated Event, the location of the Speech Event, and the designated location. For this reason, the resolution of absolute pointing signs is essentially dependent on extra-linguistic information within the situational context. Absolute pointing is effectively identical to pointing at objects that are visible in direct discourse, or for which the geographic location is given. In that sense, absolute pointing is not unique to Kata Kolok signers, but occurs in other cultures, and other sign languages, too. The main difference between the use of absolute pointing in Kata Kolok and in other

sign languages seems to be that this is the dominant strategy in Kata Kolok, whose users prefer it even when the referents or locations are invisible.

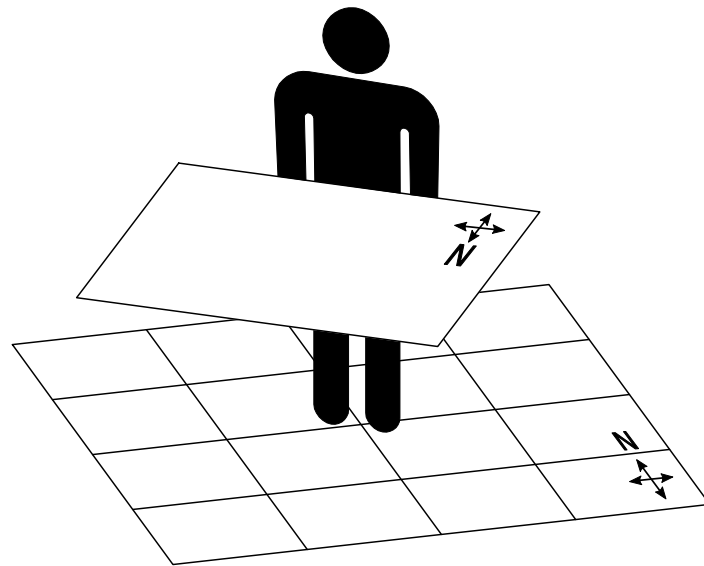
#### 6.4 *Sign-spatial maps*

If you are describing the journey from the home to the workplace, you might provide your interlocutor with a “mental tour” of the sights that you pass on your way. Alternatively, you could represent the route and surrounding locations as a diagram of the world, drawing a “mental map”. This fundamental perspective choice precedes spatial descriptions in spoken languages, co-speech gesture, and sign languages alike (Emmorey, Tversky, & Taylor 2000). In American Sign Language, for example, when a signer adopts a “viewer perspective,” spatial affairs are represented from a scene-internal viewpoint with reference to spatial objects surrounding the signer’s body. By contrast, in a “diagrammatic format,” spatial relations are scaled down to fit a diagrammatic representation that is pointed out, traced with the finger tips, or represented by the hands in the signing space to form a mental map.<sup>52</sup> Within this latter perspective, a signer may subsequently point at areas of the signing space to describe the various locations within the scene from a particular viewpoint. The internal logic of the spatial relations within the map is sustained, and the map can be shifted entirely with respect to the orientation of the real-world. Figure 6.5 illustrates this kind of shifted sign-spatial map. The grid on which the large black figure (the signer) stands represents the cardinal directions within the Speech Event. The smaller white plane in front of the signer represents the cardinal directions within the Narrated Event as the signer has projected them onto his/her neutral signing space. The compasses in each of the two grids indicate their disjunct orientations.

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<sup>52</sup> Perniss (2007:64) presents an overview of the various parallel terms that have been used in the sign literature dealing with perspective-taking.

While in Kata Kolok this kind of deixis at phantasma is not used with pointing signs that reach out of the neutral signing space, it is allowed for a diagrammatic map within the neutral signing space. Although the neutral signing space allows such shifted pointing signs, the diagrammatic format is marginal in Kata Kolok discourse. Only one instance of this kind of diagrammatic description was found within the corpus and this instance is described below.



**Figure 6.5** Shifted sign-spatial map in the neutral signing space

Example 6.1 comes from a dialogue between two sisters-in-law who are talking about a recent event where a tree fell on a hotel at a timber yard in Lovina. Lovina is a small town popular with tourists, approximately 20 kilometres south-west of the location of the recording. Figure 6.6 presents a schematic overview of the location of Lovina with respect to the recording site in Bengkala, and the signer's

orientation during the recording session, as well as the relative positions of the locations that are mentioned within the narrative.



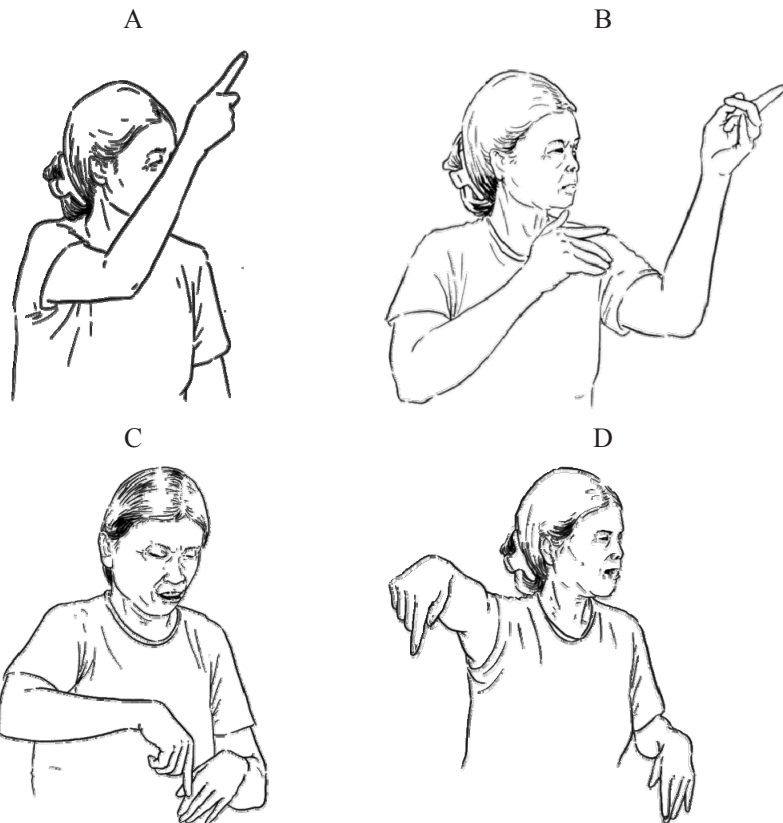
**Figure 6.6** The Petrol Station

Schematic overview of the location of the Petrol Station, location of the recording sessions, the facing direction of the signer, and the sign-spatial directions of the pointing sign

Notably, Kata Kolok does not have true toponyms; signers use pointing signs to indicate designated locations within the discourse (see section 14.2.2). Within the narrative of Example 6.1, Lovina is thus indicated by pointing signs that are directed at its geographic location; and these pointing signs, which reach outside the neutral signing space, are illustrated by panels A and B of Still 6.1. In order to identify the exact location of the damaged hotel, the signer refers to a nearby soccer field, and a petrol station where she knows her interlocutor has once bought petrol. The locations of the timber yard, where the accident took place, and the nearby petrol station, where the interlocutor once bought fuel for traditional oil lamps, are projected onto the signing space by index finger pointing signs.<sup>53</sup> Panels C and D of Still 6.1 presents images of these pointing signs, which are produced in

<sup>53</sup> It is not clear from the narrative which type of fuel was purchased, but given the local context it could have been paraffin. The exact position of the hotel is also not made explicit within this narrative, as the signer's description appears to suffice for her interlocutor.

the neutral signing space. The arrows in the transcript indicate each of the described pointing signs.



### Still 6.1 An absolute sign-spatial map

### Example 6.1 Absolute sign-spatial map (part 1)

↓ Still 6.1-A

NM

rb

MG HOUSE TOURIST IX'Lovina' HOUSE TOURIST

ND

IX'you'

'In the guest house (the hotel) there (Lovina), you know it, don't you?'

Example 6.1 Absolute sign-spatial map (part 2)

↓ Still 6.1-C

NM

MG SOCCER-FIELD TRADITIONAL-CANDLE  
OIL + +

**X‘location timber  
yard’**

ND

‘The soccer field, and then the petrol station, and then where we find the timber yard.’

↓ Still 6.1-D

NM

MG IX ‘petrol station’ OIL POUR-LIQUID OIL **IX‘petrol station’**

ND IX‘you’

‘You once bought fuel there (at the petrol stand).’

↓ Still 6.1-B

NM

MG WORK

ND **IX ‘Lovina’**

‘There is a construction site nearby.’

PiKe4jan7\_map.mpg

The pointing signs within this kind of diagrammatic format are used to talk about topography, but unlike the absolute pointing signs, which are directed at geographic locations, they cannot be resolved solely by reference to the situational context. That is, while absolute pointing signs depend on exophoric resolution, the resolution of the pointing signs that are produced within the neutral signing space additionally rely on the sign-spatial map that is created within the discourse. Importantly, Kata Kolok signers make minimal use of this sign-spatial mapping strategy, and the two tokens of pointing signs that feature in the stills in panels C

and D of Figure 6.1 constitute the only instances in 1,183 transcribed pointing signs (see Chapter 13). This fundamental distinction between deictic and anaphoric reference also surfaces in the ways in which Kata Kolok users point for persons. Another way in which signers can produce a spatial format without committing to geographic relations directly is by taking viewer perspective. This kind of referential shift is treated as a form of person deixis because it enables the signer to enact a different referent; it is discussed in section 7.5.

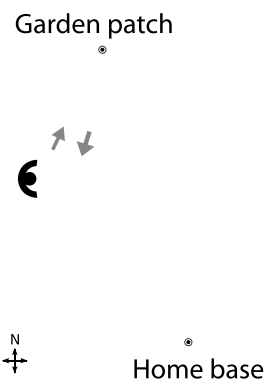
### 6.5 *General direction verbs*

In Kata Kolok, a motion event can be indicated by either a general direction verb, or an entity classifier combined with a verb of movement (see section 4.5.1). The general direction verb is formed by the full hand with spread fingers (the 5-hand described in section 4.2.1). The contextualised meaning of this general direction verb relies on two of its sign-spatial properties. First of all, the source location and goal location are indicated by the beginning and end point of the sign's movement. Secondly, these locations may be anchored either at geographic locations, or in the neutral signing space close to the signer's body. When they are anchored at the signer's body, this results in an deictic interpretation. That is, the neutral area of the signing space has become associated with the deictic origo which need not be identical to the origo of the Speech Event. The production of these deictic signs has resulted in five oppositional forms. The three exophoric forms are discussed in section 6.5.1, and are glossed as COME-HERE-FROM-A, GO-FROM-HERE-TO-B, and GO-FROM-A-TO-B. COME and LEAVE are forms that are to be resolved endophorically, and they are described in section 6.5.2.

#### 6.5.1 Exophoric general direction verbs

Example 6.2 features two instances of exophoric general direction verbs: COME-HERE-FROM-A and GO-FROM-HERE-TO-B. In this narrative, the signer is discussing the working day of a friend who, after an afternoon nap, went to cut

fire-wood, and then came back. Figure 6.7 presents a schematic overview of the location of this garden patch and the referent's home base with respect to the recording location. Importantly, the directions of the signs - indicated by the grey arrows - indicate the geographic location of the patch of land that belongs to the individual being discussed. This is the place where she regularly collects her firewood for cooking. The deictic origo is that individual's house in the village, which is not identical to the present recording site. As I will argue below, the geographic location of the referent's home base is irrelevant to the sign-spatial instantiation of COME-HERE-FROM-A and GO-FROM-HERE-TO-B.



**Figure 6.7** Firewood collection

Schematic overview of the location of the garden patch where firewood was collected, the referent's home base in the village, the location of the recording sessions, the facing direction of the signer, the movement direction of the event, and the sign-spatial directions of the signs



Example 6.2 COME-HERE-FROM-A and GO-FROM-HERE-TO-B

↓ Still 6.2-B ↓

NM pah + pt

MG SLEEP GO-FROM-HERE-TO-A

ND

‘After a nap, (she) went there (location B)’

↓ Still 6.2-A ↓

NM

MG CUT-WOOD FINISH **COME-HERE-FROM-A** CARRY-ON-HEAD

ND

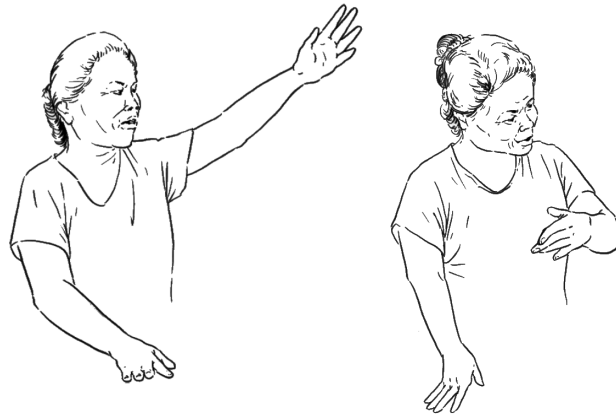
‘After cutting the fire wood, she came back here, carrying the wood on top of her head.’

ReKe10jan7\_COME-HERE-FROM-A.mpg

Still 6.2-A presents the initial and final frame of the exemplar of the sign COME-HERE-FROM-A from Example 6.2. This sign is sign-spatially modified with respect to the source location of the movement, and it is interpreted as ‘come from location A’. The sign-spatial direction of this general direction verb is relevant in the sense that it is motivated by the location of its origin –the garden patch where firewood was collected. Furthermore, the elevation of the sign in the signing space is used to indicate distance.<sup>54</sup> The goal of the sign is however not relevant in geographic terms, as the location near the signer’s body functions represents the deictic origo and thus receives the meaning ‘here, within the Narrated Event’.

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<sup>54</sup> This height-to-distance mapping is discussed in more detail with respect to pointing signs in section 12.3.



**Still 6.2-A COME-HERE-FROM-A**  
(from Example 6.2)

Still 6.2-B displays the initial and final frame of the sign GO-FROM-HERE-TO-B, taken from Example 6.2. GO-FROM-HERE-TO-B is construed in a similar way to COME-HERE-FROM-A, but now the general direction sign is produced with movement away from the body, and is spatially modified with respect to the geographic goal location; it is interpreted as ‘go from here to location B’. Here, signers only commit to the goal of the movement as indicated by the sign-spatial relationship. That is to say, the signer can be held accountable for her indication of the geographic goal location. Because interlocutors carefully inspect the sign-spatial properties of these signs, Kata Kolok signers could also lie about where someone went, for example, just by producing the sign GO-FROM-HERE-TO-B in an inaccurate direction. Further, the current location of the origo is sometimes (as here) interpreted as being the location of the Narrated Event rather than the location of the Speech Event. As becomes clear from the illustration in Figure 6.7 this results in forms whose sign-spatial directions are shifted with respect to the actual absolute direction of the event.



**Still 6.2-B GO-FROM-HERE-TO-B**  
(from Example 6.2)

GO-FROM-A-TO-B is spatially modified with respect to both the geographic source and goal locations. Neither the source location nor the goal location is thus represented by the deictic origo, and the signer commits to both the actual source location and the actual goal location. This form of the general direction verb is interpreted as ‘went from location A to location B’. GO-FROM-HERE-TO-B, COME-HERE-FROM-A, and GO-FROM-A-TO-B are all particularly large signs because they are (in part) produced in the extended signing space, being directed to geographic locations.

Still 6.3 displays an instance of GO-FROM-A-TO-B as it was produced in Example 6.3. In this sentence, the form GO-FROM-A-TO-B is used to describe the path and distance that the signer’s friend needs to travel to bring her goods to the market. Note that the first use of the sign B:i, which is directed at the signer’s chest, refers to the individual who features in the narration, rather than the signer herself. The second time the sign appears, it refers to the signer herself, who feels sorry for her friend.



**Still 6.3 GO-FROM-A-TO-B**  
(from Example 6.3)

Example 6.3 GO-FROM-A-TO-B

↓ Still 6.3 ↓

NM ‘feel sorry’  
MG SIGN-NAME(KS) B:i CARRY-ON-HEAD **GO-FROM-A-TO-B**  
ND

NM ‘feel sorry’  
MG CARRY-ON-HEAD B:i  
ND

‘I feel sorry for KS. She brings her goods all the way to the market by herself.’

PiKe4jan7\_GO-FROM-A-TO-B.mpg

### 6.5.2 COME and LEAVE

There are also two instances of the general direction verb in which the signer does not commit to either the source or goal location of the sign-spatial characteristics

of the signs. These are the signs COME and LEAVE. COME is made with a full hand, but produced in the central area of the signing space and is reduced in size. Still 6.4 presents an example of this form as it produced in spontaneous Kata Kolok signing. Although it is difficult to identify the exact location in the signing space based on this frontal recording, the form is in relative proximity to the signer's body compared to the stills in 6.5.1. The instances of COME in the corpus are also reduced in size, and in some cases, only the part of the hand from the knuckles downward produces a single movement and the fingers are naturally closer together as a result.

Example 6.4 presents a sentence from a narrative about the Japanese invasion of Bali during the Second World War. The Balinese people would stand guard with guns in case the soldiers, who are referred to by the signer with the lexical sign BOSS, returned. Still 6.4 displays the lexical sign COME as used in

Example 6.4. Notably, the use of this sign-spatially neutral general direction verbs rare in Kata Kolok discourse. Its use in this context could be motivated by the nature of the information being conveyed. That is, the signer is retelling events as he was taught by his father as a child. He acquired this information second-hand, and may therefore not be in a position to commit to the geographic details of the Narrated Event.



**Still 6.4** COME 'come here'  
(from Example 6.4)

Example 6.4 Neutral form of COME

NM

MG CL:B'person walking' COOK-RICE#INTENS STEAM

ND

'One person would go cook rice and the steam would come up...'

↓ Still 6.4

NM 'look around'

MG STAY-QUIET BOSS **COME** GUARD-WITH-GUN

ND

'... (the others) would stay quiet and guard (the place) in case one of the soldiers came.'

Gta6oct7\_COME.mpg

### Example 6.5 HEY: Attention getting device

'I said: "Come ghost, sign with me", but it disappeared.'

Finally, when producing the sign LEAVE, the signer makes a movement upward in the neutral signing space. As with the sign COME the signer does not commit to the absolute sign-spatial properties of the sign LEAVE, but rather the sign means ‘away from the location that is discussed within the narrative’. The fact that absolute direction is not relevant in these cases becomes particularly clear in the comparison of two subsequent instances of the sign made by two interlocutors, referring to the same location. In Example 6.7, such a test case occurred within a narrative between two ladies who are discussing one of their daughters. This girl goes to school in Jimbaran, in the south of Bali. Signer 1 (on the left) asks Signer 2 (on the right) ‘Has D. left yet?’ Signer 2 confirms by saying ‘She left for (Denpasar) three days ago.’<sup>55</sup>

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### Example 6.6 LEAVE

Signer 1 (on the left)

↓ Still 6.6-A ↓

NM	<u>br + nod</u>	<u>br + nod</u>	<u>br</u>
MG	SIGN-NAME'D.' LEAVE	THREE	SIGN-NAME'S.'

ND

'Has D. left yet? How about S.?'

Signer 2 (on the right)

↓ Still 6.6-B ↓

NM		'pah'
MG	SIGN-NAME'D.' THREE-DAYS-AGO~THREE	LEAVE

ND

'D. left three days ago.'

ReKe10jan7\_GO-AWAY.mpg

Stills 6.7-A and B present stills of both instances of LEAVE. Note that although both signers are talking about the same event - a person named D. leaving the village for Denpasar - the signs they produce for LEAVE are directed upward. Moreover, the right-hand images of Stills 6.7-A and B, illustrate that the signers' wrists are slightly overextended in the final movement of LEAVE, ultimately resulting in arbitrarily directed and opposite sign-spatial forms. Specifically, Denpasar lies south of the village, yet the sign LEAVE by Signer 1 is produced towards the east, and the sign LEAVE by Signer 2 is produced towards the west. The comparison of these two instances of LEAVE shows that a signer need not commit to the absolute sign-spatial properties of the sign when it is produced in the neutral signing space.





**Still 6.7-A** LEAVE by signer 1 (on the left)



**Still 6.7-B** LEAVE by signer 2 (on the right)

### 6.6 *Summary and discussion*

In the domain of spatial deixis, Kata Kolok signs are highly motivated by geographic locations with respect to placement and direction. This becomes evident in three ways. First of all, Kata Kolok's pointing system, which is discussed in more detail in section 14.2, relies crucially on absolute pointing. Secondly, when signers produce deictic forms of general direction verbs, the sign-spatial properties of these signs often conform to geographic locations. The truly deictic nature of these signs becomes clear from the fact that sign-spatial maps in the neutral signing space in front of the signer can be shifted and represent the locations of the Narrated Event, rather than the 'here and now' of the Speech Event. Thirdly and finally, when signers produce down-scaled maps of the

environment in the neutral signing space, the internal logic of the map need not adhere to the orientations of locations of the real world. While pointing signs that are directed at geographic locations are dependent on situational information for their resolution, pointing signs in the neutral signing space can be resolved based on signing alone. These observations lead to the conclusion that the distinction between the neutral and the extended signing space in Kata Kolok is crucial to describing the interpretation of sign-spatial phenomena. Moreover, the distinction between the neutral and the extended signing space maps onto the fundamental dichotomy between deictic and anaphoric reference.

As was mentioned in section 6.3, absolute pointing is not used exclusively in Kata Kolok, and this type of pointing is presumably available to many sign language and speech communities. Furthermore, while diagrammatic maps in Kata Kolok are based on the absolute Frame of Reference, they resemble the topographic use of signing space in other sign languages in all other ways. One of the remaining questions is therefore to what extent the sign-spatial repertoire used by Kata Kolok signers to describe topographic formats deviates from the sign-spatial structures used by signers of other sign languages. This study has adopted naturalistic data to identify the structures that Kata Kolok signers use, but in order to fully assess the differences between Kata Kolok and other sign languages in the topographic functions of signing space, we may need to test the differences more rigidly. Part IV of the thesis presents such methodology with regard to Frame of Reference expressions, using similar elicitation materials in each case.

## ***7 Person reference in Kata Kolok***

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### *7.1 Overview*

This chapter charts the key structures devoted to person reference in Kata Kolok, and in doing so, it investigates the appropriateness of a pronominal analysis of pointing signs that indicate people and objects. As such, this chapter is intimately related to the discussions on pointing in Part V of the thesis, and contains cross-references where relevant. Section 7.2 describes the theoretical background to the pronominal analysis of pointing signs in the sign language literature. Section 7.3 will support previous reports that Kata Kolok signers do not localise referents onto the neutral signing space; rather, like pointing signs with locative functions, pointing for person is dominated by geographic space. Additionally, section 7.4 presents new evidence that signers use an essentially anaphoric pointing strategy to indicate people, by projecting referents onto their fingertips. This phenomenon is known as list buoys (Liddell 2003: Chapter 10). Section 7.5 also reveals that Kata Kolok signers may produce pronominal pointing signs in the neutral signing space when they are in role shift. Section 7.6 concludes by presenting an overview of the ways in which Kata Kolok's pronominal pointing system differs from other sign languages. While this chapter by no means presents a comprehensive overview of grammatical person, nor person reference in the language, section 7.6 touches upon a few potential implications for a cross-modal typology of both signed and spoken languages.

### *7.2 Pronominal pointing to people in sign languages*

The first analyses of pointing signs took place in the mid-1970s and presumed the grammatical status of pointing signs. In these publications, pointing signs are analysed in parallel to personal pronouns in spoken languages (Friedman 1975; Kegl 2003 [1976]). These original studies focussed on pointing in American Sign

Language, but the phenomenon has been described for many sign languages since (see for instance Ahlgren (1990) on Swedish Sign Language; Engberg-Pedersen (1993:117-139) on Danish Sign Language; Zeshan (2000:99) on Indo-Pakistani Sign Language; Berenz (2002) on Brazilian Sign Language). Crucially for the grammatical analysis of pronominal pointing in these studies, it has been observed that a grammatically relevant locus is established by pointing at locations in the signing space. A locus is “a direction from the signer or a point in the signing space by which a referent is represented” (Engberg-Pedersen 1993:14 on Danish Sign Language). The functions of loci were illustrated in section 1.4.2.

In 1990, several papers were published that challenge the grammatical status of loci (Liddell 1990) as well as the analogy between pointing to indicate people in sign languages and personal pronouns in spoken languages (Ahlgren 1990; Lillo-Martin & Klima 1990; Meier 1990). The main critique of the grammatical status of loci is the fact that, as they constitute points in space, there is a potentially infinite number of formally distinct pronominal forms. As I will argue in section 12.3, due to the inherent restrictions on human perceptual abilities as well as basic geometric facts, pointing signs may not effectively single out locations in space. Furthermore, according to Lillo-Martin & Klima (1990), an analysis in terms of unique loci might also result in the unlikely situation where the signed lexicon lists an infinite number of formally distinct pointing signs. According to Liddell (2000), this leaves sign language linguists without an adequate phonological model to describe pointing signs. However, as Russell & Janzen (2006) point out, the acoustic realisation of vowels in spoken languages exhibit equally vague boundaries, while the instantiation of a certain vowel can still be recognised as a token of a type given the context in which it is produced.

Another criticism made by Liddell is that the notion of ‘locus’ is insufficient to describe the behaviour of a subclass of agreement verbs that are not directed at a specific point in space, but rather directed towards a mental image of that referent

(Liddell 2003:75). Liddell presents the example of the directional verb ASK-QUESTION, which is directed at the addressee's chin rather than an arbitrary and stable location in the signing space (locus). When this addressee is considerably taller than the signer, the directional verb will be directed upwards. Conversely, when the signer is, for instance, addressing a small child, the verb is sign-spatially directed towards a location in the signing space that is much lower than the canonical form. The debate about the linguistic status of loci thus revolves around their sign-spatial nature. According to Liddell (2003) this sign-spatial construction of discourse is problematic for a morphosyntactic analysis of sign-spatiality and he therefore proposes a gestural analysis of these phenomena. As was discussed in section 5.2, sign-spatial mappings acquire meaning at various levels of linguistic structure and for this reason Liddell's proposal is not adopted here.

Another reason why pointing signs are often categorised as non-linguistic is the fact that their meanings are highly context-dependent. As Enfield (2009) points out, this argument is based on a naive view of language that is exclusively based on conventionalised meaning. In reality, where language is used spontaneously, many aspects of meaning must be gained from contextual sources. One need only think of deictic words in English such as *here*, *yesterday*, *he*, etc to realise that their full meaning can only be determined when they occur in an appropriate context.<sup>56</sup> It is only when these deictic elements occur within a composite utterance including speech, gesture, and context that they achieve their complete meaning potential. Within Enfield's view of the composite utterance, pointing signs should be considered symbolic-indexicals, because they combine non-conventional and conventional aspects of meaning (Johnston 2010b).

When we assume that loci are of a linguistic nature, a number of problems remain with the analysis of pronominal pointing as indicating grammatical person.

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<sup>56</sup> Chapter 5 also addressed this issue briefly.

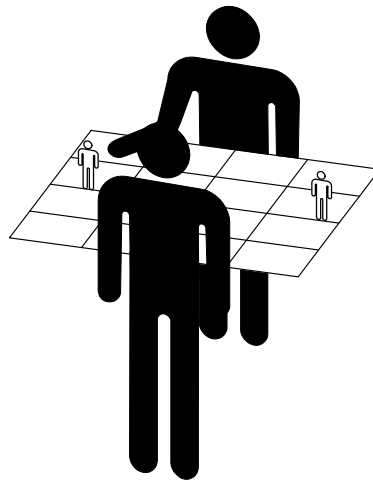
Ahlgren (1990), for example, emphasises that, although pointing signs may refer to people, they are formally indistinguishable from locative points in Swedish Sign Language. In other words, pointing signs that indicate people make demonstrative references to real-world locations indicated by individuals, and for this reason, Swedish Sign Language does not have lexical items referring to the roles of participants in the speech act. Ahlgren's analysis of Swedish Sign Language seems radical, but in many spoken languages demonstratives either overlap with third person pronouns, or are otherwise morphologically related (Bhat 2011). This chapter mainly addresses the question as of whether Kata Kolok pointing signs that indicate persons and objects are additionally differentiated by the grammatical category of person. Section 14.3.1 describes the way in which Kata Kolok signers differentiate between place and person references in spontaneous discourse.

Meier argues (1990) that pointing signs indicating first person have a grammatical status in American Sign Language, as reflected by their stable form: they are fixed in having contact between the finger and the trunk of the signer (Meier 1990). Section 14.3.2 presents corpus analyses that support a distinction between first-person and non-first person in Kata Kolok as well: first person reference is made with the B-hand rather than the IX-hand, and these signs also touch the chest, as in American Sign Language. Meier (1990) rejects the grammatical difference between second and third person, while maintaining a first versus non-first distinction for American Sign Language. The most important reason for Meier is that the canonical loci for second and third person are not used systematically. For example, an addressee could easily be to your left or right, rather than directly in front of the signer, and in this case, it is the actual location of the referent rather than his/her speech act participant role that determines the direction of the pointing sign: the pointing signs are always motivated by the conceived location of the referent rather than by a grammatically predetermined location in the signing space. This makes it impossible to judge which grammatical

category a pointing sign belongs to outside of the physical context of its use. Berenz (2002), among others, has suggested that eye gaze patterns may formally distinguish second from third person references in Brazilian Sign Language. That is, while eye gaze is hypothesised to be directed at the addressee when addressing him/her, this would not be the case in third person indications. This is, however, not a systematic distinction in American Sign Language (Meier 1990), nor in Kata Kolok (see the analysis presented in section 14.3.3). The sections below provide an overview of the pointing signs that indicate people and objects in Kata Kolok, and suggest that, in addition to a first versus non-first person distinction, the language might set apart third person reference through the use of list buoys (see section 7.4).

### *7.3 Absolute pointing for person reference*

Section 1.4.2 explained the notion of localisation: assigning grammatically relevant loci in the neutral signing space to referents by pointing at those loci. This was illustrated by Figure 1.3, here repeated as Figure 7.1. The large black figure at the back represents a signer who points at one of the white miniature referent in his neutral signing space (the grid). The foregrounded figure is his/her interlocutor. The present section focuses on the sign-spatial aspects of pointing signs that indicate people and objects.



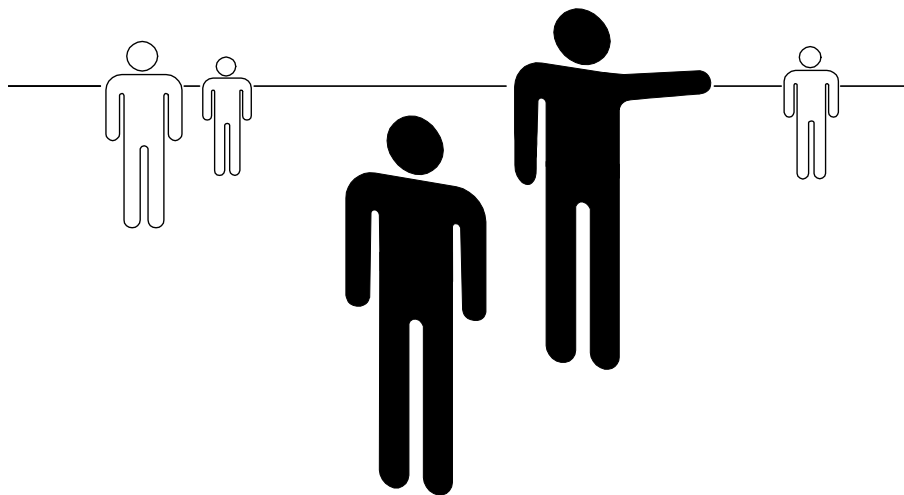
**Figure 7.1** Localisation: pointing at third persons in the neutral signing space

In Kata Kolok, as in many other reported sign languages, signers direct pointing signs at individuals who are present when referring to them (see for example Ahlgren (1990) on Swedish Sign Language). In case these individuals are not present in the speech event, the canonical way to refer to individuals in Kata Kolok, is by using a lexical expression, e.g. GHOST or sign name, followed by a pointing sign that is directed towards a geographic location frequented by the individual referred to - usually that person's house, work place, or patches of farmland. This contrasts with urban sign languages that canonically project referents onto the neutral signing space (see for example Friedman (1975); Kegl (2003 [1976]) on American Sign Language; Ahlgren (1990) on Swedish Sign Language; Engberg-Pedersen (1993:117-139) on Danish Sign Languages; Zeshan (2000:99) on Indo-Pakistani Sign Language).

Figure 7.2 illustrates the canonical way in which absent individuals are pointed at in Kata Kolok. As in Figure 7.1, the large black figures represent the signer and his/her interlocutor, and the small white figures represent individuals who are



absent from the setting in which the conversation takes place. Reference is made by indicating the geographic locations associated with these individuals. Importantly, this does not imply that signers are always aware of the whereabouts of everyone in the village. In most cases, signers select the location of an individual's house or garden patch, regardless of whether the referent is there or not. The use of absolute pointing signs to refer to individuals has also been reported of Providence Island Sign Language (Washabaugh 1986:36), Al-Sayyed Bedouin Sign Language (Sandler et al. forthcoming), and also for the co-speech gestures of Yéli Dnye speakers (Levinson 2007).



**Figure 7.2** Absolute pointing for third person

#### Example 7.1 Absolute pointing in person reference

NM

MG HEY PIDAN + + + #INTENS FATHER SIGN-NAME'SI' **IX'SI's garden'**

ND

'In SI's father's time...'

Gta6oct7\_geographic\_pointing.mpg

Example 7.1 illustrates the use of absolute pointing for third person reference. The signer has just begun telling a narrative set in the Second World War. He starts his story by framing events as 'the time of SI's father', SI being one of the older deaf villagers. He signs PIDAN+++ #INTENS FATHER SIGN-NAME 'SI' followed by an index finger pointing sign directed at SI's garden: IX'SI garden'.<sup>57</sup> This garden is not visually accessible at the scene of the recording. The pointing sign provides potentially redundant information, and is not interpreted as a locative predicate; rather it identifies the location that is subsequently used to refer to this individual. In contrast to other sign languages, Kata Kolok signers do not normally establish anaphoric loci in the neutral signing space. Rather, the sign-spatial direction of a pointing sign is motivated by shared background knowledge of individuals and associated geographic locations.

In some cases, a sign name occurs simultaneously with an index finger point, as illustrated in Example 7.2. The two signers of this conversation are talking about financial difficulties. One signer advises the other that her interlocutor need not take care of her niece anymore, since the niece got married. The pointing sign produced simultaneously with the sign-name is directed at the actual location of that individual who is present at the recording session.

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<sup>57</sup> The gloss INTENS indicates intensification, which is discussed in more detail in section 4.6.

Example 7.2 Pointing simultaneously with sign name

Signer 1 (on the left)

NM

MG **SIGN-NAME'SI'** NEG DIFFERENT NEG

ND **IX'SI'**

'You don't need to share with SI, because she now belongs to another family.'

Signer 2 (on the right)

NM

MG NEG BUY NEG

ND

'I don't have any money.'

ReKe10jan7\_signname\_simultaneous\_pointing.mpg

*The differences between localisation and absolute pointing*

The Kata Kolok system contrasts with the use of anaphoric localisation in other sign languages in multiple ways. With localisation, pointing signs are downscaled and canonically directed at a signing space directly in front of the signer. Contrastingly, Kata Kolok's pointing signs are directed at geographic locations and therefore often directed toward the signing space in front of, beside or behind a signer. Localisation is also more flexible than absolute pointing; in Kata Kolok, the indicated location needs to be directly associated with that referent, while the process of localisation allows any referent to be allocated a spatial locus in the neutral signing space. Conversely, Kata Kolok pointing signs in part rely on extra-linguistic, situational information, while the resolution of loci relies on information endophoric to the discourse context. Furthermore, the placement of loci in signing space is sometimes motivated to reflect the respective height of signers (for example when talking to a small child, see Liddell 2003:75 on American Sign Language), but also to reflect more abstract categories such as definiteness (Barberà

2012 on Catalan Sign Language), or social hierarchy (Engberg-Pedersen (1993:75) on Danish Sign Language; Zeshan (2000:101) on Indo-Pakistani Sign Language). When discussing government institutions, for instance, Danish Sign Language and Indo-Pakistani Sign Language users often project these higher in the signing space than other referents. These latter kinds of metaphoric sign-spatiality are not available to Kata Kolok. To indicate authorities, Kata Kolok signers preface sign names with the lexical sign BOSS.

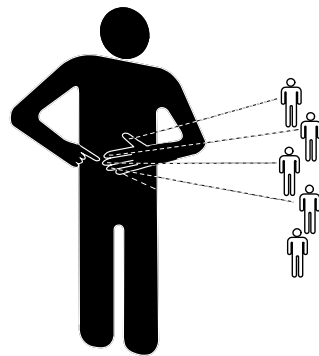
#### *7.4 Anaphoric functions of list buoys*

The fact that people are referred to by absolute pointing signs which are directed toward associated geographic locations raises the question of what options are available to signers when they do not know the referent very well. What if one wants to talk about a person one has just met and of whom one does not know where she lives? One such situation occurred spontaneously when some of the deaf dancers went to Singaraja on Indonesia's national day of independence to perform the Janger Kolok (described in more detail on p. 31). I had not attended the festivities but one of the women wanted to tell me about it, and was partly mocking other dance groups that performed at the event. As it was already night-time it was not possible to make a video recording of her narrative. Nevertheless, it was apparent that she was using a construction I had hitherto not observed.

The signer introduced each of the dancers by giving them ad hoc sign names based on their physical features; each of these sign names was followed by a pointing sign to a subsequent fingertip on her non-dominant hand. Throughout this stretch of discourse, the signer pointed back to her fingertips to refer to each of the four dancers she was describing. The use of the fingers of the non-dominant hand has been observed for a number of sign languages, including American, Norwegian, and Swedish Sign Languages (Liddell, Vogt-Svendsen, & Bergman 2007). The phenomenon is known as "list buoys" and is described most clearly by

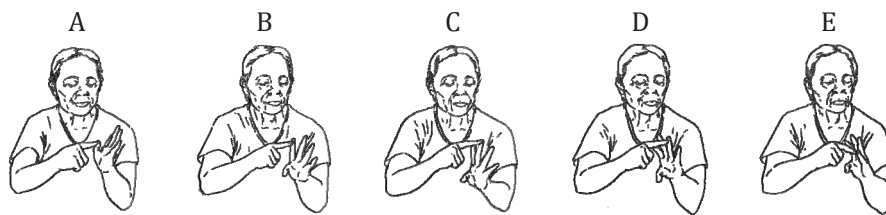
Liddell (2003: Chapter 10) in a story called “The Five Brothers”. As Liddell (1990) points out, the meanings of list buoys are very general outside a specific discourse context because of their co-referential nature. Unlike pointing signs that are directed at geographic locations, the locations of the fingertips are not resolved by reference to the situational context, and their meanings remain vague outside the signed discourse. In other words, as anaphoric elements, list buoys do not presuppose geographic knowledge, but rather construct a discourse by enumerating and thereby contrasting specific referents.

Figure 7.3 illustrates the use of list buoys, where each fingertip of the signer’s left hand is associated with a referent, represented by the small figures. Note that the referents as represented by the small figures need not be individual people; in Kata Kolok list buoys are also attested in reference to objects, groups of individuals and family members. In other sign languages list buoys are often used to list abstract concepts (Liddell, Vogt-Svendsen, & Bergman 2007), but this function has not been observed in spontaneous Kata Kolok discourse. It should also be kept in mind that Kata Kolok signers prefer to point at geographic locations outside the neutral signing space, and rarely need to adopt a list buoy strategy.



**Figure 7.3** Diagram of list buoys

In Example 7.3, a stretch of discourse is presented to illustrate the use of list buoys in reference to family members. In order to understand this example, one needs to know that in the hearing Balinese culture the hierarchy of siblings is crucial in name-giving, and there are also associated co-speech gestures to refer to each. The thumb refers to the first born child, the index finger to the second, etc. In this example, the signer herself is the first of five deaf children of a deaf couple. She is discussing her family history, and she has just explained how her parents met and got married. Hence, the topic of this stretch of discourse is the parents, although there are no signed forms referring to them explicitly. The subsequent list buoys are glossed by the names of the individual fingers IX:thumb, IX:index, IX:middle, etc. Still 7.3 illustrates the list buoys with still images taken from Example 7.2. In this example, the signer starts by pointing at her thumb and her chest (first person singular) to indicate the fact that she was the first-born. Following this, she says STUPID, implying that her parents were quite inexperienced at child rearing at the time. SM, BD, and SK are sign names of her siblings. One sibling does not have a name as she died at a very young age. She refers to this fourth sibling as ‘a girl’.



**Still 7.3** Example of list buoys  
(from Example 7.3)

Crucially, the sign-spatial forms of list buoys do not provide any information about the referent; rather, they function as truly anaphoric pointing signs linked to referents that can only be resolved internally by reference to the signed discourse. In parallel to Meier's (1990) argument in favour of a grammatical first-person category in American Sign Language, section 14.5.3 argues that list buoys are lexicalised in having a fixed form. Their anaphoric functions become particularly evident from the repeated indication of **IX:thumb** and **IX:pinky**, which are marked in bold in the transcription. In the second line of the transcript, the signer refers to herself as 'the first one' (glossed as **IX:thumb**). In the final line of the transcript one can see that indicating the pinky (glossed as **IX:pinky**) is used to create a locus to refer to her youngest brother named SK, and this locus is referred to anaphorically later in the discourse, to indicate that he would not accept breast milk.

#### Example 7.3 List buoys (part 1)

↓ Still 7.3-A

NM

MG **IX:thumb** GROW B:i GROW STUPID

ND FIVE

‘The first child was me. At the time when I was born, (my parents) were inexperienced (at child rearing).’

NM

MG RECENT-TIME **IX:thumb** STUPID

ND

‘Around the time of the first one, (they) were inexperienced.’

Example 7.3 List buoys (part 2)

↓ Still 7.3-B

NM

MG **IX:index** SIGN-NAME'SM' GOOD

ND

.....  
'The second one, SM, went well.'

NM

MG MONTH ONE MONTH TWO OFFSPRING TAKE-CARE GOOD

ND

.....  
'Two months passed and they took care of the baby well.'

NM

MG GROW **IX:index**

ND

.....  
'The second child grew.'

↓ Still 7.3 C

NM

MG **IX:middle** SIGN-NAME'BD' DIE

ND

.....  
'The third, BD, died.'

↓ Still 7.3-D

NM

MG **IX:ring** FEMALE DIE

ND

.....  
'The fourth, a girl, died.'



Example 7.3 List buoys (part 3)

↓ Still 7.3-E

NM

MG **IX:pinky** SIGN-NAME'SK' **IX:pinky** NURSE NEG

ND

‘The fifth is SK. He would not accept breast milk.’

Si7feb8\_listbuoys.mpg

Finally, I have found preliminary evidence that list buoys can be used in conjugation with certain transitive predicates, unlike absolute pointing signs that indicate third person. This particular use of list buoys occurred, along with other constructions, in response to video stimuli with unfamiliar individuals enacting reciprocal events (see Evans et al. 2004). While this data set has not been fully analysed as yet, Example 7.4 illustrates the phenomenon. In contrast to Example 7.3, the signer does not start off with the full hand, but rather with only three fingers extended (the index, the middle, and the ring fingers). She then adds the little finger, too, to indicate that there are, actually, four people involved. The transitive predicate SPEAK is modified to indicate its arguments three times in the example, as indicated by bold script. Additionally, as indicated by italic script, the signer modifies her index finger pointing signs to represent the movements of the individuals in the video.

Example 7.4 Transitive predicate SPEAK with list buoys (part 1)

NM

puff

MG IX ‘ring’ + IX ‘index’ **SPEAK:middle**

ND THREE FOUR

‘There are three, no four people and the one on the left speaks to the one next to that person.’

Example 7.5 Transitive predicate SPEAK with list buoys (part 2)

NM

MG *IX'index > ring'* FEMALE:index MALE:middle **SPEAK: index > middle**

ND

-----  
'The one on the left goes to the third person...the one on the left is a woman, and the middle one, a man, and she speaks with him.'

NM

MG *IX'middle > ring'* FEMALE:ring finger MALE:middle

ND

-----  
'Then, that man goes to the third person, a woman.'

NM

MG **SPEAK: middle > ring**

ND

-----  
'And, he speaks with her.'

Si31aug8\_directionaliy\_listbuoys.mpg

As mentioned above, Kata Kolok signers do not adopt the list buoys strategy to refer to abstract notions. As can be noted from the filenames associated with Examples 7.3 and 7.4 above, both stretches of discourse stem from recordings of the same signer. This raises the question of whether the use of list buoys might be a structure that is idiosyncratic to this particular individual. This does not appear to be the case, however, since the Reciprocal data set<sup>58</sup> abounds with examples of this phenomenon in the data from the other three signers who decribed the videos as well. Furthermore, I have observed at least four additional signers from the third,

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<sup>58</sup> The stimuli for this data set stem from Evans et al. (2004).

fourth, and fifth generations of signers adopting this discourse strategy during the fieldwork activities described in section 3.3. These two observations suggest that list buoys are in fact a pervasive and fruitful structure in Kata Kolok discourse. Once the phenomenon is fully analysed, this referential strategy is thus expected to contribute considerably to our understanding of cross-linguistic diversity in list buoys, and anaphora, and their interaction with directional predicates in the language.

The anaphoric use of list buoys has previously been described in a number of sign languages that also deploy localisation (Liddell, Vogt-Svendsen, & Bergman 2007). In the case of Indo-Pakistani Sign Language, however, this structure appears to be used solely for enumeration (Zeshan 2000:101d). That is, while list buoys can be analysed as an additional set of ordinal numbers, they do not appear to be used to refer back to referents, nor to serve as loci in the sign-spatial modification of transitive predicates. This observation indicates that list buoys are used anaphorically by some, but not all sign languages. Furthermore, Kata Kolok does not have distinct plural pronominal forms, but rather juxtaposes multiple singular forms. In American Sign Language, however, these pronominal forms are formally derived from the language's cardinal number set (McBurney 2002:337). All in all, this cross-modal comparisons might indicate an intricate relationship between quantification and grammatical number in sign languages. This interpretation is particularly intriguing as the grammaticalisation from ordinal numbers to third person pronouns has not been attested in spoken languages, and would therefore constitute a modality-specific pattern of grammaticalisation.

### *7.5 Role shift and pointing*

Role shift is a structure that is of particular relevance to the domain of person reference. Role shift is a phenomenon where signers essentially 'become' the referent they refer to (Engberg-Pedersen 1993:103). Role shift thus functions as a

deictic mechanism as one mimics the actions of someone other than oneself. This deictic shift is indicated by an abrupt change of the position of the torso, and head and shoulders, as well as facial expression, to enact and thus refer to one of the participants within a narrative (Lillo-Martin 1995). In literature dealing with this person deictic device, the phenomenon is referred to by different names, including constructed action (Metzger 1995), quoted action (Quinto-Pozos 2007), role play (Loew, Kegl, & Poizner 1997), shifted attribution of expressive elements (Engberg-Pedersen 1993:105), and referential shift (Sandler & Lillo-Martin 2006:379).

Similar to other deictic strategies in sign languages, referential shift has been found in part to rely on sign-spatial strategies. That is, in addition to an abrupt change in facial expressions, signers reportedly shift their torso and shoulders from left to right to indicate different discourse participants. These shifts depend on a diagrammatic mapping of the referents onto the signing space (see Perniss (2007:194) on German Sign Language; Pyers & Senghas 2007 on American Sign Language). This torso and shoulder re-orientation does not seem obligatory to achieve the referential shift, however (Engberg-Pedersen 1993:103-116 on Danish Sign Language). Furthermore, recent findings from research into Nicaraguan Sign Language reveal that this language does not make systematic use of the diagrammatic format to indicate referential shifts, but uses very different strategies, such as pointing and labelling the referent lexically (Pyers & Senghas 2007).

At this point, the exact properties of role shift in Kata Kolok are under- studied, but I would nonetheless like to point out one interesting function that has been identified. As discussed in previous sections, it has previously been reported that Kata Kolok signers do not point in the neutral signing space to establish referential loci in the absence of referents. However, preliminary evidence is presented which suggests that Kata Kolok signers may point in the neutral signing space while they are employing role shift. In such cases, a pointing sign is marked by raised

eyebrows, a forward head tilt and eye gaze is directed towards this location. This it is interpreted as an indication of an addressee in a reported conversation. These three combined non-manual signals give the impression of a conversational partner being present.

To illustrate how the phenomenon works I present a glossed sentence here. Example 7.5 is taken from a signer telling a story about his son and daughter-in-law fighting over food, as they are hungry. His daughter-in-law is looking for the key to the cupboard where the meat is kept, and then asks her husband whether he has hidden the key. The sign name of his daughter-in-law is ‘pretty’ and I will adopt this pseudonym here. Her question ends in a pointing sign towards her husband glossed as IX‘you’. This pointing sign is produced by the narrator in neutral space using role shift. The signer’s own body thus effectively represents his son while addressing his wife (the signer’s daughter-in-law).

#### Example 7.6 Pointing at absent addressees during role shift

NM

MG SIGN-NAME‘Pretty’ SEARCH SIGN-NAME‘Pretty’ SEARCH

ND

‘Pretty is searching.’

NM

fht#ea#rb

MG ANGRY QUARREL HEY KEY HIDE IX‘you’

ND

“Angrily she quarrels: ‘Did you hide the key?’

Gta6oct7\_2PS\_rolshift.mpg

The occurrence, in reported conversations, of pointing signs towards absent addressees in the neutral signing space presents additional evidence that role shift essentially enables a deictic shift, not only for pointing signs to oneself (see

Example 6.3 in section 6.5.1), but also towards addressees. Notwithstanding this finding, the use of these shifted non-first person points is rare. In more than a thousand pointing signs analysed in detail, there are only seven such tokens. Further, the pointing signs are not identical to the ‘loci’ that are established during localisation, because the indicated locations are not subsequently used for other grammatical devices (as described in section 1.4.2). The ‘loci’ are not subsequently used to refer back to that individual, transitive verbs are not modified to indicate that location, etc. In other words, this type of pointing in the neutral signing space is most similar to quoting a pointing sign rather than creating a grammatical locus in signing space. Furthermore, the shifts described above have been found for reported second person, but not for grammatical third person referents. As such, Kata Kolok might make a further grammatical distinction between second and third person, but more data is needed to establish this. These and other aspects of pronominal pointing in Kata Kolok are addressed in more detail in section 14.3 of the thesis.

## 7.6 Summary and discussion

This chapter has charted Kata Kolok’s deictic devices with regard to grammatical person. Table 7.1 presents an overview of the various person-deictic structures that have been attested in other sign language as well as the main references and whether or not they are attested in Kata Kolok.

PERSON-DEICTIC STRUCTURES	OTHER SIGN LANGUAGES	KATA KOLOK
Role shift	<p>+</p> <p>(Metzger 1995; Quinto-Pozos 2007, Loew, Kegl, &amp; Poizner 1997; Engberg-Pedersen 1993:103ff; Sandler &amp; Lillo-Martin 2006:379, but see Pyers &amp; Senghas 2007.)</p>	<p>+</p> <p>(Section 7.5)</p>
Pointing in role shift	<p>+</p> <p>(For example, Bellugi &amp; Klima 1982; Ahlgren 1990; Meier 1990; Engberg-</p>	<p>+</p> <p>(but infrequent)</p> <p>(Section 7.5)</p>

	Pedersen 1993:103.)	
List buoys	+	+
	(Liddell, Vogt-Svendsen, & Bergman 2007)	(but infrequent) (Section 7.4)
Absolute pointing for third person reference	+	+
	(but infrequent) (For example, Washabaugh 1986:36; Sandler et al. forthcoming.)	(dominant pattern even when referents are absent)
		Section 7.3 and 14.3.1
Localisation	+	-
	(dominant pattern) (For example, Friedman 1975; Ahlgren 1990; Engberg-Pedersen 1993:53; Zeshan 2000:99.)	(Section 1.4.2)
Verb inflection	+	-
	(For example, Engberg-Pedersen 1993:154f; Sutton-Spence & Woll 1999; Liddell 2003:98ff; de Beuzeville et al. 2003; Hong 2009, but see Aronoff et al. 2004.)	(only with list buoys) (Sections 7.4 and 7.6)

**Table 7.1** Person deixis in Kata Kolok and other sign languages

One of the most remarkable findings of the Kata Kolok pointing system is the fact that people are normally indicated by pointing at geographic locations. Although referents may be projected onto the neutral signing space, this strategy is marginal and is only permitted during role shift. The finding that Kata Kolok does not deploy verb agreement to transitive verbs becomes less surprising in light of the description of the pointing system. That is, if referents are not normally projected onto the neutral signing space, it is to be expected that these locations will not be used for verb agreement either. It might thus be the case that anaphoric, rather than deictic pointing is a necessary precursor of agreement verbs in sign languages. Such a prediction is consistent with analyses that treat verb agreement in sign languages as a form of affixation of personal pronouns (see for instance Pfau 2011).<sup>59</sup> Circumstantial evidence from Kata Kolok supports the affixation

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<sup>59</sup> section 4.8 of this thesis deals with verb agreement more elaborately.

hypothesis, as list buoys have been found to attract inflected transitive constructions in response to the Reciprocal data set. While this data set has not yet been fully analysed, these preliminary observations suggest that the relationship between anaphoric pointing and verb agreement should be explored further. This issue is taken up in section 8.6.

Previous analyses of sign languages have indicated that they may provide a counterexample of the supposed linguistic universal that claims that all languages have local pronouns, that is, all languages have forms referring to the speech act participant roles of signer/speaker and addressee. Additionally, from a typological perspective, it would be extremely remarkable if any particular language did not grammatically differentiate between demonstratives and pronouns in any way, as suggested by Ahlgren (1990) for Swedish Sign Language. Meier's (1990) analysis of American Sign Language is also conspicuous as it suggests that this sign language, and possibly others, may not set apart second and third person reference, which stands opposed to what is expected and known of the majority of spoken languages. The sections above tentatively argued that Kata Kolok might set apart third person reference by deploying list buoys. The use of list buoys are particularly intriguing from a cross-modal perspective as they appear to be derived from ordinal numbers. This grammaticalisation path had hitherto not been reported in spoken languages, and this shows that, as suggested by McBurney (2002), much is to be gained from systematically comparing grammatical paradigms in signed and spoken languages, taking cross-modal typology as a vantage point.



## ***8 Temporal inference in Kata Kolok discourse***

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### *8.1 Overview*

Many sign languages use sign-spatiality to represent temporal relations when they position signs along an imaginary line in the signing space to represent the order of events (see section 1.4.3). A subset of lexical signs may also be modified according to such timelines, for example, where adverbs with historical meanings are produced with a movement towards the rear of the signer, and temporal adverbs with a futuristic meaning are produced with movement towards the space ahead of the signer. As has been described in section 1.4.3, Kata Kolok deploys a celestial timeline that uses pointing to refer to the times of day and night. This celestial timeline also occurs with a subset of lexical signs (Zeshan 2006a; section 8.3). This chapter charts Kata Kolok's system of temporal reference further.

Section 8.2 discusses data collection and analysis with regard to temporal reference in Kata Kolok narratives. Section 8.3 presents the workings and limitations of Kata Kolok's celestial timeline. With rare exceptions, temporal adverbial constructions in Kata Kolok do not draw on any type of sign-spatial mapping (Zeshan, Marsaja, & de Vos in prep.). Furthermore, most temporal adverbs in Kata Kolok are vague with respect to future or past reference. Moreover, the language is tenseless as it does not mark future or past by the inflection of verbs. In all these respects the language is remarkably similar to descriptions of Warlpiri Sign Language (Kendon 1993). Section 8.4 discusses the fundamental vagueness of Kata Kolok temporal deixis which arises as a result, and the temporal inference by which temporal deixis is resolved within spontaneous discourse. Section 8.5 describes a few inferential mechanisms by which temporal adverbs are resolved in Kata Kolok discourse. This section draws on analyses by Bohnemeyer (2003; 2009) of Yucatec Maya, a spoken language that functions in similar ways to Kata Kolok. Section 8.6 concludes the chapter and Part III of the

thesis by suggesting that the attested differences in the use of sign-spatiality for discourse functions, between Kata Kolok and other sign languages, may in part be related to a preference for exophoric over endophoric structures.

## 8.2 *Data collection and analysis*

Data analysis for temporal inference consisted of two types. The initial analyses were based on spontaneous discourse from Kata Kolok signers: dialogues, multi-party conversations, and monologue narratives. Signers who agreed to be recorded for the monologue narratives were sometimes prompted to discuss events both in the distant past, recent past, and in the future. This data set includes stories about mythical times (when there were big swans and sea creatures in Bengkala), colonial times (the Dutch occupation and WWII), the recent past (the Bali bombings in 2002 and 2005), and future plans. Table 8.1 summarises the topics that occurred in these data.

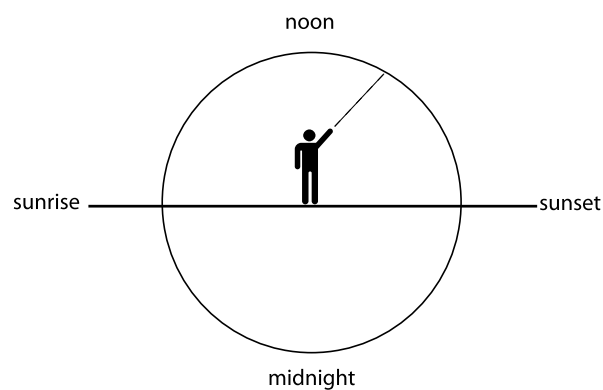
TIME FRAME	TOPICS
Mythical times	Sea creatures, big swans in Bengkala
1940-1945	WWII
2002, 2005	Bali bombings
A few weeks ago	Hindu ceremonies
Future	Marriage plans, family planning

**Table 8.1** Data used for temporal analysis

Following the analyses of the spontaneous data set, two structured interviews were conducted to elicit specific structures and inquire about the meta-linguistic awareness of signers concerning temporal inference. These interviews were conducted with two signers, and each lasted for half an hour.

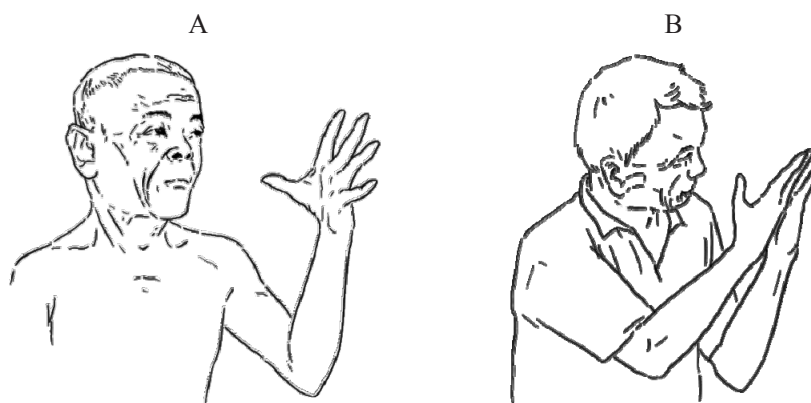
### 8.3 *The celestial timeline*

As described in section 1.4.3, in most other described sign languages the timeline runs along a signer's sagittal axis, and is split at the signer's centre, such that the back of the signer represents the past, and the front of the signer represents the future. In Kata Kolok, however, there is no indication of a body-anchored timeline. After explicit questioning, two Kata Kolok signers who are familiar with Indonesian Sign Language, which does have a body-anchored timeline, indicated that they are aware of two types of timelines. Whereas Indonesian Sign Language uses a body-anchored timeline, Kata Kolok signers use a celestial timeline that runs from east to west. The celestial timeline is restricted in its use compared to body-anchored timelines in other sign languages. Use of this timeline primarily consists of pointing signs indicating the times of day and night by being directed at the usual position of the sun at that time (see section 14.4 for a detailed description of the use of celestial pointing). Figure 8.1 illustrates Kata Kolok's celestial timeline, which is common to other absolute gesture systems as well (see for example Levinson 2003:262; Gaby 2009; Floyd 2010).



**Figure 8.1** Celestial timeline

In addition to these celestial pointing signs, the lexical sign MORNING is produced in the eastern corner of a signer's signing space (Zeshan 2006a). Figure 8.2 illustrates this with stills of the same signer, who uses the sign MORNING facing in two different directions. In still A (on the left), the camera is south of the signer, and in still B (on the right), the camera is west of the signer. In the former case, the signer uses his left (non-dominant) hand to produce the sign for MORNING in the eastern corner of the signing space. In the latter case, the signer even twists his torso to his left to produce a sign that is compatible with the geographic location of sunrise. This might be the first reported case of a lexical sign which has a built-in absolute orientation.



**Figure 8.2** The sign MORNING is always produced in the eastern corner of the signing space

The celestial timeline is not used for other lexical signs. Specifically, it cannot be used on a lexical level for larger quantities of time such as months, years, or centuries. It is not used to indicate the past or future in general, either. The analyses

of spontaneous discourse as well as linguistic elicitation sessions indicate that the celestial timeline is not used to structure the temporal relation between events in Kata Kolok. Moreover, as will become clear in section 8.4, the celestial timeline is not used to mark temporal adverbs.

So Kata Kolok has a celestial timeline which is used to refer to clock hours, but this timeline has not been extended to other temporal domains. Is there a causal link between these two findings? The Kata Kolok timeline is similar to the co-speech gestures of Kuuk Thayorre speakers, who do use a celestial timeline to indicate the temporal relation between events (Gaby 2009; Boroditsky & Gaby 2010). Like Kata Kolok's timeline, Pormpuraawans' representations of time are not linked to the body, but rather to cardinal directions. In this remote aboriginal community, time flows from east to west, and this is reflected by their co-speech gestures in spontaneous narratives as well as their responses to cognitive tasks (Gaby 2009; Boroditsky & Gaby 2010). This observation suggests that there is nothing about celestial timelines in general that prohibits them from being used in more extensive ways.

Interestingly, Kata Kolok's comparatively restricted use of sign-spatial structures in the domain of temporal deixis makes it similar to Warlpiri Sign Language in this respect (Kendon 1993). Warlpiri Sign Language is not a primary sign language used by generations of deaf signers, but rather an auxiliary sign language that is used by an aboriginal community in special social circumstances such as mourning. Kendon describes that "the Warlpiri do not conceive of time as a flow that bears future events towards one and past events away behind one. For them, the main contrast is between present and non-present." Further he adds "[Warlpiri] signs that refer to the future are not spatially distinct from those that refer to the past and the movement components of these signs do not entail any reference to movement through space." As shall become clear in the sections below, Kata Kolok's conception of time is remarkably similar to the system

described of Warlpiri, both in its lack of sign-spatially motivated temporal adverbs, and in its emphasis on present versus non-present, rather than future and past.

#### 8.4 *Ambiguity of time adverbial constructions*

One of the most striking facts about Kata Kolok time deixis is that there are no separate manual signs for past and future. There is however a lexical sign used to indicate temporal displacement: not in the present. The sign has been glossed as PIDAN, following the Balinese word for ‘the time when’. Figure 8.3 displays a still of an intensified form of the sign which is made by placing the index finger on the cheek repeatedly.<sup>60</sup> The spoken word and the sign both refer to either past or future times and can be literally translated as ‘the time when’ (Shadeg 2007:398). Moreover, with a few exceptions, time adverbial constructions are generally underspecified with respect to past or future reference. Section 8.4.1 discusses these exceptions, followed by a discussion of the non-present marker PIDAN in section 8.4.2.



**Figure 8.3** PIDAN: non-present

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<sup>60</sup> Section 4.6 discusses intensification in detail.

#### 8.4.1 Time units

Kata Kolok has four signs that are unambiguous with respect to time. These are the signs meaning ‘yesterday’, ‘two days ago’, ‘three days ago’ and ‘four days ago’. The forms of the signs were described in detail in section 4.4 as they are part of a paradigm of numeral incorporation. Kata Kolok has no specific signs to refer to future times. To indicate days in the future, one produces the cardinal number. Kata Kolok does not have a lexical sign meaning ‘day’.

On rare occasions, the cardinal number is preceded by the sign for COUNT at the cheek followed by the cardinal number. This construction is illustrated by Example 8.1.

##### Example 8.1 Six days ago

NM

MG LEAVE COUNT-DAYS SIX LEAVE

ND

He went away. Six days ago he went away.'

PiKe4jan7\_6daysago.mpg

Kata Kolok’s signs for specific numbers of days in the past are a form of numeral incorporation very common in sign language time indications (see also Liddell 2003:20). Unlike other sign languages, however, Kata Kolok signers do not use numeral incorporation with time units other than days. The lexical sign for month traces the shape of the full moon in the sky. The lexical sign used to indicate years is identical to the sign RAIN. It is unsurprising that the sign RAIN implies years, because Bali has annual rainy seasons. Multiple years and months are indicated by the cardinal number following the lexical sign. These constructions are lexically ambiguous with respect to past or future reference, however. This type of ambiguity is not uncommon cross-linguistically. In Hindi, for instance, the word *kel* can either mean yesterday or tomorrow, and is often disambiguated by a tensed

verb (Kachru 2006). Without a tensed verb, the word remains vague in meaning. Kata Kolok does not have lexical signs for specific months of the year. Signers are not ignorant of the fact that hearing villagers refer to months using specific names, however, and one of the strategies used by Kata Kolok signers is to refer to specific months is to point at the different pages of a yearly calendar.

Another interesting finding is that Kata Kolok does not have signs for the particular days of the week, either, while both spoken Balinese and Bahasa Indonesia have lexical items for these concepts. The only ‘counterexample’ is that since the establishment of a school that admits deaf pupils, the construction WRITE NEG (‘non-school day’) has been observed to function as a time indication to discuss plans for free time on Sunday.<sup>61</sup> The Balinese culture has in fact a wide variety of lexicalised items to refer to days and weeks that vary in their numbers of days per cycle (Covarrubias 1950:283). In the domains of colour and kinship, similar discrepancies between the Balinese lexicon and Kata Kolok have arisen, with Balinese having a more extensive lexicalised set than Kata Kolok (de Vos 2011; section 4.3). These observations raise questions about the co-evolution and calibration of cultural and communicative practices in deaf villages.

#### 8.4.2 PIDAN: the non-present

In addition to adverbial constructions with specific time units, Kata Kolok has a general temporal adverb that indicates events at a temporal distance, regardless of whether the event will happen in the distant future, or has happened in the distant past. Within the data set this non-present marker, PIDAN, was used to indicate future reference 24 times by 10 different signers. The use of PIDAN to indicate past times, however, is much more frequent; this historical interpretation of PIDAN was attested 102 times in the same data set.

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<sup>61</sup> The village school was described in section 3.2.2.



Marsaja (2008:165) says that non-manual marking could distinguish future or past reference. According to him, signers hold their heads back slightly and make a frown, to signify past time, while to signify future time, they move their head forward and raise their eyebrows slightly. Although the same variation has been observed in the current data set, it appears that this variation is due to inter-signer variability, rather than an attempt to disambiguate the meaning of the sign. According to Marsaja, a further differentiation is that future reference of PIDAN only occurs in interrogatives, thus suggesting that the status of an utterance as a question may cue the future meaning of PIDAN. Additional data presented here show that the interpretation of PIDAN is indeed partly dependent on the pragmatic context in which it is used. However, future reference is not restricted to questions. The examples below reveal that PIDAN attains a specific interpretation only within the discourse context. The sections below discuss instantiations of PIDAN in usages that vary minimally in form yet maximally in interpretation, and describe how PIDAN attains variably a past time reference, a future time reference, or a hypothetical interpretation.

*PIDAN: past reference*

The first example is from the start of a narrative where a signer was asked to talk about the colonial period of Balinese history. This example was also discussed in section 7.3 as Example 7.1. He starts his sentence with the sign HEY; an attention-getting device.<sup>62</sup> He then indicates the time of the events by signing PIDAN+++#INTENS FATHER SIGN-NAME‘SI’ IX‘SI’s garden’. Still 8.2 displays a still of this intensified form of PIDAN.<sup>63</sup> The whole construction is best translated as ‘SI’s father’s time’. The fact that SI’s garden is indicated should not be considered a place indication, but rather a further indication of this person (see

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<sup>62</sup> This attention-getting device is also discussed on p. 185.

<sup>63</sup> Intensification is discussed in section 4.6.

section 14.3.1 on the overlap between place and person indications). In Kata Kolok it is possible to use calendar years to indicate time periods by signing each digit of the year individually, so the signer could have set the narrative in time using a year, such as 1945. However, this strategy is not normally used in spontaneous discourse. Instead, the signer chooses to link the events to a shared acquaintance: an elderly deaf man who recently passed away, SI's father. By virtue of the fact that the signer and his interlocutor (the research assistant behind the camera) have known this man and known him to have been one of the oldest deaf men alive in the village, the interpretation of PIDAN as a past-time reference arises. In this particular context the past time reference might also have been clear from the fact that the signer uses the lexical sign for 'coloniser'. However, as the research assistant who made this recording later explained, he had not been familiar with this lexical sign, but was able to understand its meaning from the ongoing discourse. The narrator might have been aware that his interlocutor could be unfamiliar with this sign, therefore choosing to specify time based on the age of the shared acquaintance.



**Still 8.2** Historical interpretation of PIDAN 'the time when'

Example 8.2 Historical interpretation of PIDAN 'the time when'

↓ Still 8.2

NM

MG HEY **PIDAN** + + + #INTENS FATHER SIGN-NAME'SI'

ND

'Hey, at SI's father's time...

NM

MG COLONIAL TOURIST GUN ALL-HERE#INTENS SHARPEN-BAMBOO

ND

'...and also at the time the Dutch soldiers came with many guns, we fought them only with sharp bamboo poles.'

Gta6oct7\_PIDANINTENS\_past.mpg

PIDAN can also acquire a historical interpretation without explicit reference to shared background knowledge. Example 8.3 stems from a narrative about a deaf ghost that is believed to live in the village. This recording session took place at the signer's patch of land just outside the main village. The signer was asked to talk about his encounter with the deaf ghost, and he was quite keen to do so. He starts his story by saying there used to be many ghosts in the village. PIDAN+++ gets a historical interpretation in this context, though the sentence is underspecified with respect to tense. The indication to the village's holy tree refers to the common knowledge that this is one of the locations, along with the village cemetery, where ghosts reside.



**Still 8.3** Underspecified instance of PIDAN 'the time when'

Example 8.3 Vague instance of PIDAN ‘the time when’

↓ Still 8.3

NM

MG **PIDAN** + + + IX‘village tree’ WALK MANY

ND

‘There used to walk around loads of them over there (at the village’s tree).’

NM

MG IX + + + ‘several locations in the village’ GHOST MANY BIG

ND

‘There were also many ghosts at various other locations (in the village.)’

Gta6oct\_PIDAN\_vague.mpg

*PIDAN: future reference*

As mentioned above, PIDAN is essentially ambiguous with respect to past or future tense. In the examples below PIDAN acquires a future and implied hypothetical interpretation. In Example 8.4, the signer is discussing her interlocutor’s daughter-in-law and offers some advice. Her daughter-in-law and son have three daughters at the moment, and given the importance of male offspring in Balinese culture, the signer advises that her son and daughter-in-law should live by themselves so that she can get pregnant again and have a baby boy. Still 8.4 presents an image of the form of PIDAN used in Example 8.4. Note that the future interpretation of PIDAN arises here, because the signer and her interlocutor both know that this couple has not had male offspring yet.



**Still 8.4** Future 'form' of PIDAN

Example 8.4 Future interpretation of PIDAN 'the time when'

NM

MG SIGN-NAME'SD' Entity-CL:IX'person'

ND Entity-CL:IX'person'

'She should (live in the house only) with her husband...'

↓ Still 8.4

NM

MG **PIDAN** + + + PREGNANT OFFSPRING MALE

ND

'... then she will deliver a baby boy.'

ReKe10jan7\_PIDAN\_future.mpg

*PIDAN: hypothetical interpretation*

In Example 8.5, a signer describes how his son died in a traffic accident. Here PIDAN+++#INTENS attains a durative, hypothetical interpretation. The first part of the sentence STAY PIDAN+++#INTENS BAD-SMELL PIDAN+++ BAD-SMELL ALL LEAVE is signed with the signer's dominant (left) hand, while the second part of the sentence is signed with both hands. This prosodic demarcation leads to the interpretation of the first part of the utterance as a conditional clause. Note that here, the sign PIDAN acquires a hypothetical interpretation because it would be inconceivable to leave someone who has just died lying in the sun. There is however no formal marking that indicates this, as with the other forms of PIDAN. Still 8.5 presents a still of this form of PIDAN.



**Still 8.5** PIDAN 'the time when' as conditional clause marker

Example 8.5 PIDAN 'the time when' as conditional clause marker

↓ Still 8.5

NM

MG STAY **PIDAN** + + + #INTENS BAD-SMELL PIDAN + + + BAD-SMELL

ND

'If (the dead body) had stayed here, it would have started to smell badly...'

NM

MG ALL LEAVE DIG~BURRY BURRY HERE FINISH

ND

'...and decay, so a grave was dug, it was buried...'

NM

MG BLESS-WITH-WATER FINISH

ND

'...and blessed with holy (coconut) water.'

Gta6oct7\_PIDANINTENS\_future.mpg

The prosodic marking of conditional clauses has been reported in a number of sign languages (see Coerts 1992 on Sign Language of the Netherlands; Zeshan 2000:117 on Indo-Pakistani Sign Language; Dachkovsky 2004 on Israeli Sign Language). In Indo-Pakistani Sign Language, for instance, signers raise their eyebrows and open their eyes widely to indicate the conditional clause, and it is additionally marked by a prolonged hold of the final sign accompanied by a head nod (Zeshan 2000:117). It is possible that Kata Kolok signers also deploy such purely prosodic strategies to mark conditionals, but the use of non-manual signals in the language is at present under-researched. The Kata Kolok corpus contains detailed video recordings which could facilitate future analysis of facial expressions, thus filling this particular gap in the description of the language (see p. 68).



The examples above show that PIDAN has a general temporal meaning, the interpretation of which is dependent upon the discourse context in which it occurs. The general meaning of PIDAN can be paraphrased as ‘non-present’, though within specific discourse contexts the sign can mean: a long time ago, in the distant future, or acquire an interpretation as a conditional clause marker.

### *8.5 Temporal inference*

As with other sign languages, Kata Kolok does not deploy a tense system. For this reason, a potential ambiguity arises in spontaneous text with respect to past or future reference. There is no evidence that Kata Kolok signers are ever confused about the distinction. How, then, do Kata Kolok signers structure their discourse in such ways that it becomes clear as to whether they are talking about past, present or future times? Section 8.5.1 notes that Kata Kolok does not have any lexical, temporal and logical connectives, and as such the language is very similar to the spoken language Yucatec Maya. In line with Bohnemeyer’s (2009) work on Yucatec Maya, I discuss a number of mechanisms that are at play in temporal inference. Section 8.5.2 describes how the completive aspect marker is interpreted to indicate the recent completion of an event, by default. Further, in construction narratives Kata Kolok signers rely on shared background knowledge, including the timing of events within the community, such as the birth of certain individuals (section 8.5.3). Finally, section 8.5.4 shows how the modal verb WANT implies future events.

#### *8.5.1 No connectives*

In order to develop an understanding of temporal deixis in Kata Kolok, it is important to realise that the language does not have temporal connectives either. There are no lexical signs with a comparable meaning to English ‘before,’ ‘after,’

‘while,’ or ‘until.’<sup>64</sup> In this regard, Kata Kolok looks surprisingly similar to the spoken language Yucatec Maya, a tenseless language of Mexico that does not have any of these lexical items either (Bohnmeyer 2009). Furthermore, in Yucatec Maya, too, temporal adverbs play a minor role in achieving temporal reference. The question arises, therefore, of how these languages deal with temporal relations. Bohnmeyer (2009) frames this issue with respect to Yucatec, as follows:

“it is safe to assume that it is as important for Yucatec speakers as it is for English speakers to be able to distinguish narrative accounts of past events from predictions of future events or declarations of intentions about future events, and for example, descriptions of habits or statements of general rules. The question [...] is not whether Yucatec speakers are able to infer that the topic time of any given utterance lies in the present, past, or future of coding time or some reference point; the question is how exactly they do this.”

Bohnmeyer 2009:113

According to Bohnmeyer, Yucatec Mayans predominantly rely on pragmatics for the specification of temporal relations. In line with Bohnmeyer’s work, I discuss some of the ways in which Kata Kolok achieves temporal reference.

#### 8.5.2 Temporal inference and the completive aspect marker

While Kata Kolok does not mark tense systematically, the language does mark aspect using two function signs: the completive aspect marker FINISH and the negative completive aspect marker NOT-YET. In section 4.7 the formal use of these markers has been described. This section addresses their function in discourse-embedded temporal inference. Example 8.6 presents a sentence in which the completive aspect marker FINISH occurs directly after the predicate CHOP.

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64 Moreover, there are no logical connectors such as ‘because,’ ‘but,’ or ‘if’ either. It should also be noted that, although there is no lexical sign meaning ‘while,’ certain simultaneous constructions can convey this.

This utterance is from a narrative of a signer who is casually chatting about his daily routine and discussing recent village events. He mentions that a ritual feast was recently held, at which chickens were slaughtered, put on a stick, and coloured with turmeric. The translation of this sentence was made by the bilingual research assistant, who was present at the recording, and the utterance is given the time frame ‘recently’. Importantly, this interpretation arises by default when a Kata Kolok signer commits to the fact that an event has finished without a preceding context that discusses the event. The signed statement becomes directly relevant to the discourse context.

Example 8.6 The timing of events is interpreted as recent by default

NM

MG RITUAL-FEAST CHICKEN IX‘over there’ CHOP FINISH

ND

‘A temple-festival involving a feast of chopped chicken has (just) finished,

NM

MG IX‘over there’ CHICKEN CHOP IX‘over there’

ND

...there (in Bengkulu)’

KK-inthehutDn1\_default.mpg

### 8.5.3 Temporal inference and shared background knowledge

In cases where a signer wants to describe an event that took place further back in the past, the events are framed with respect to shared background knowledge. For instance, a deaf woman using Kata Kolok indicated a specific time period by indicating that she had not yet been married, using the completive aspect marker. On another occasion, she indicated that she had had her first child, but that her second child had not been born yet, using both the completive and the negative completive.

The description of events that may take place in the future can also be inferred on the basis of shared knowledge. Example 8.7 illustrates this. This utterance describes a conversation the signer had with the author a few days prior to the recording session. This conversation, among a group of signers, revolved around the issue of whether people prefer to have sons or daughters. In Bali, as in many other place of the world, people prefer to have sons. When I was asked whether I would prefer to have a son or a daughter, I replied I would prefer to have one of each. In Example 8.7, the expression TOURIST IX‘village’ ‘the tourist in the village’ refers to me.<sup>65</sup> As with other examples, when viewing the example below in isolation one may not know whether this event has or has not occurred.

#### Example 8.7 Inferred future reference

MG B:i TALK TOURIST IX‘village’ FRIEND IX‘village’

ND

‘That’s what Connie told me. She has a boyfriend.’

MG PIDAN OFFSPRING SMALL Handle-CL‘walk child’

ND

‘She will then be pregnant and have a child. Then she will tend the child.’

Gtb6oct7\_inferred\_future.mpg

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<sup>65</sup> Interestingly, the signer places me and my partner, or FRIEND, who has never been to the village, at the same location in the village (IX‘Village’). In my view, this shows that even though the absolute pointing signs are exophorically motivated, they retain a certain level of abstraction.

#### 8.5.4 Temporal inference and the modal verb WANT

Additionally, the description of future, or hypothetical events may also be inferred by the occurrence of the modal use of the verb WANT. This is illustrated in Example 8.8, which followed directly after Example 8.7.

##### Example 8.8 WANT as future marker

NM

MG FATHER IX'Europe' FATHER IX'Europe'

ND

'Then the father over there (in Europe)...

NM

nod

MG OFFSPRING WANT MALE FEMALE

ND

...wants to have one boy and one girl. That would be enough.'

Gtb6oct7\_WANT.mpg

Given the fact that signers structure their discourse based on shared knowledge rather than explicit marking, one might wonder whether signers ever specify the exact year in which an event occurred, or the number of years that have passed since the event. Within the structured interviews described in section 8.2, signers were asked to specify when events occurred in several ways. For instance, one of the signers was asked how many years ago she married. After giving it some thought, she responded by indicating the age of a mutual acquaintance at that time, and in my view this demonstrates that the signer provides a socially and culturally appropriate response. Her response is presented in Example 8.9. Because I know SU is now approximately 20 years old, I can infer that the wedding must have taken place approximately 14 years ago. This strategy was used by both signers

who took part in the interview, relating to various questions about past and future events.

#### Example 8.9 Framing event

NM

MG SIGN-NAME'SU' RAIN SIX

ND

'SU must have been six years old, at the time.'

The mechanisms described above only touch upon the pragmatic complexities in which temporal relations are inferred, in a language that does not mark these differences lexically or syntactically. In other sign languages, non-manual, prosodic cues can express logical dependency relations, and this strategy could also play a role in Kata Kolok (see for example the work on Israeli Sign Language; Dachkovsky 2004). Prosody is one of the domains in which the research on Kata Kolok is less developed at this point, and future research should be conducted to assess the viability of the hypothesis that non-manual, prosodic marking may indicate future reference.

### 8.6 *Summary and discussion*

Strikingly, many of Kata Kolok's deictic devices described above require extra-linguistic information to be resolved. Spatial deictic forms are directed to geographic locations (chapter 6), and this pattern also dominates in pronominal pointing signs (chapter 7). Chapter 8 has shown that in the domain of time deixis, too, Kata Kolok capitalises on shared background knowledge, rather than linguistic encoding. In the description of Providence Island Sign Language, Washabaugh et al. (1978) noted that signers share a large amount of background knowledge, and make use of this common ground when constructing discourse. In other words, the fact that deaf villages have emerged in small, isolated, and tight-knit communities

might thus have an impact on the ways in which the signing space is used. The findings presented throughout this part of the thesis support Washabaugh's hypothesis, though in a specific way: exophoric reference predominates in Kata Kolok discourse.

This dominance of exophoric reference may be facilitated by the fact that Kata Kolok is normally used in a context in which signers have a large amount of shared background knowledge and are surrounded by geographic locations that are familiar to their interlocutors. The differences between village sign languages and urban sign languages might thus be caused by the different social contexts in which they are used, rather than a typological difference. This hypothesis predicts that urban signers may also use exophoric references more often when they sign in familiar environments with interlocutors that they know very well, and there is at least anecdotal evidence that this may be the case. In 2005, I was an intern in the Sign Language Research group at the Radboud University and a research assistant in the Sign Language Typology group at the Max Planck Institute for Psycholinguistics. Both groups were located in Nijmegen, less than one kilometre apart. Members of both research groups would indicate these locations by using geographically motivated pointing signs rather than using lexical expressions, or localising these locations in the neutral signing space. Conversely, in section 7.4 it was shown that when a village sign language is used in a contextually poor environment, use of the descriptive functions of the signing space may increase. The image on the front cover of this thesis illustrates the use of list buoys in a spontaneous conversation that took place among Kata Kolok signers in a van driving from Singaraja to Danau Tamblingan, which is approximately 40 kilometres from Bengkulu. Within this van, the use of anaphoric list buoys was preferred over absolute pointing signs, presumably because of the continuously changing location and orientation of the van. These preliminary observations indicate that the context-dependency hypothesis is correct, and deserves further

investigation. In assessing this hypothesis we need to make sure that we compare optimally similar text types from similar social settings in both urban and village sign languages. This need is addressed in section 16.2.



## ***PART IV SIGN-SPATIALITY AND THE DOMINANCE OF THE ABSOLUTE FRAME OF REFERENCE IN KATA KOLOK***

Part IV establishes the main empirical finding that if there is a preferred Frame of Reference in Kata Kolok, it is the absolute Frame of Reference. This means that Kata Kolok signers generally foreground absolute spatial relations between elements of a scene being described, and generally background their own view of the scene. As such, Kata Kolok signers construct spatial configurations in radically different ways from what is known about and expected from other sign languages. Another remarkable finding is that in spatial cognition tasks, Kata Kolok signers do not exhibit a preference for absolute solutions as predicted by the neo-Whorfian hypothesis. Balinese culture reinforces multiple Frames of Reference and all three may be adopted in the cognitive tasks. This discrepancy might imply that the relationship between language and cognition is mediated through additional eco-cultural factors (see also Mishra & Dasen 2010:83; 297).

## ***9 Frames of Reference in sign languages***

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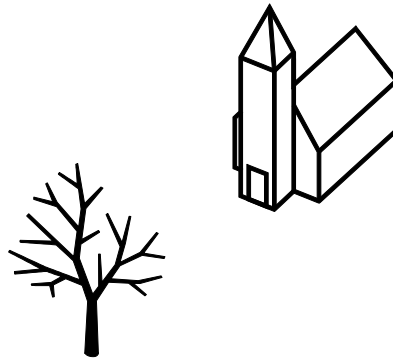
### *9.1 Overview*

Sections 9.2 and 9.3 introduce Levinson's (2003) threefold typology of Frames of Reference and its relationship to Landmark-based expressions. In line with previous observations, section 9.4 hypothesises that Kata Kolok predominantly uses a geocentric conceptualisation of space. Section 9.5 introduces the issue of sign-spatial significance: the question of whether and to what extent it is sensible to apply Frames of Reference to sign language data. Section 9.6 argues that the applicability of Levinson's Frames of Reference Theory can be tested on signed expressions using the rotation paradigm as a linguistic elicitation tool. The rotation paradigm originally constituted a set of cognitive tasks to investigate the psychological reality of linguistic spatial representations (Senft 2007). The tasks are based on the differential truth values of each Frame of Reference after rotation of the spatial entities within the Figure-Ground array. Given the sign-spatial nature of signed descriptions, the rotation paradigm predicts systematic changes and constants in signed descriptions after rotation of the signer. These predictions formed the theoretical base that was used for data collection and for the analyses presented in subsequent chapters.

### *9.2 Frames of Reference*

Linguistic expressions that are used to specify the spatial relation between a backgrounded object (the Ground) and a foregrounded object (the Figure) are called Figure-Ground constructions (Talmy 2003). Consider the spatial configuration in Figure 9.1 with a Ground object (the church) and a Figure object (the tree), repeated from Figure 1.1 in the Introduction. In English, there are multiple, valid ways to describe this scene, including "the tree is to the left of the

church”, or “the tree is in front of the church”, or perhaps even “the tree is to the west of the church”.



**Figure 9.1** Ground object (the church) and Figure object (the tree)

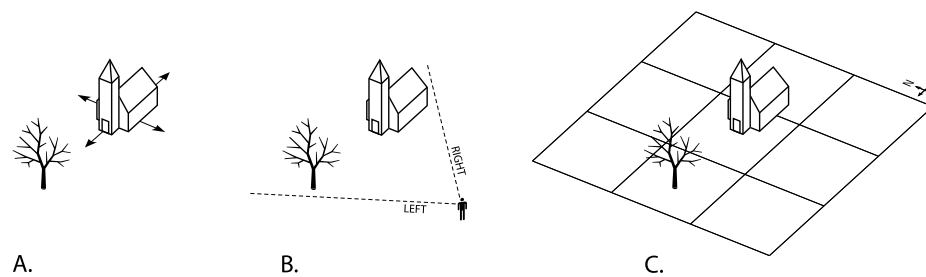
These three options constitute three linguistic types of description, which are called Frames of Reference (Levinson 2003). Languages may vary in the preferred type of Frame of Reference: relative, intrinsic, or absolute. A description within a relative Frame of Reference relates the positions of the Figure and Ground objects based on a scene-external viewpoint, for example, “the tree is to the left of the church”. Note that although an external viewpoint is not made explicit in the linguistic description itself, it is implied by the word ‘left’, which requires a viewpoint to be interpreted correctly. Figure 9.1 can also be described based on the intrinsic properties of the Ground object, namely “the tree is in front of the church.” Here, a property of the church, namely its having a perceived front, is essential to the interpretation of the sentence. The third Frame of Reference is the absolute Frame of Reference, and depends on fixed bearings rather than a viewpoint or the inherent facets of the Ground - “the tree is to the west of the church,” for instance.

Many languages make all three Frames of Reference available to their users, yet language users may choose to use different Frames of Reference in different situations. The Frame of Reference used in descriptions of these kinds of everyday arrays is considered to be the dominant Frame of Reference for users of that language. Pederson et al. (1998) operationalise the dominant Frame of Reference within a language as the Frame that is used in tabletop arrays. This section has provided a first-pass identification of Frame of Reference expressions based on the superficial semantics of the terms. However, the fundamental differences between the ways that users of such Frames conceive of spatial relations may not be evident without the kind of analysis that is provided in the sections below. These three different types of descriptions are not mere cultural oddities of communicative equivalence; they have different truth values. Section 9.3 describes their spatial-semantic traits.

### *9.3 Anchoring of the Frames of Reference*

Frames of Reference are essentially coordinate systems that are anchored in different aspects of the Figure-Ground array. From a given anchor, x and y-axes are projected to specify the angular relation between the Figure and Ground object. Figure 9.2 illustrates the anchoring of the intrinsic, relative, and absolute Frames of Reference. The intrinsic Frame of Reference is anchored in the Ground object, from which facets the angles are projected. This is marked in panel A, in which arrows are projected from the church building. The relative Frame of Reference expression is anchored in an external viewpoint. This is made visible in panel B, which shows an individual viewing the scene. As mentioned above, a viewpoint need not mean a person that is present at the scene, and in most cases remains implicit in an actual description. Finally, an absolute Frame of Reference is anchored in fixed bearings that overlay the whole scene. This type of system is indicated by the placement of a grid and a compass indicating the orientation of the

axes, as in panel C of Figure 9.2.<sup>66</sup> These three representations map onto the three descriptions given above: intrinsic (“the tree is in front of the church”); relative (“the tree is to the left of the church”); and absolute (“the tree is to the west of the church”).



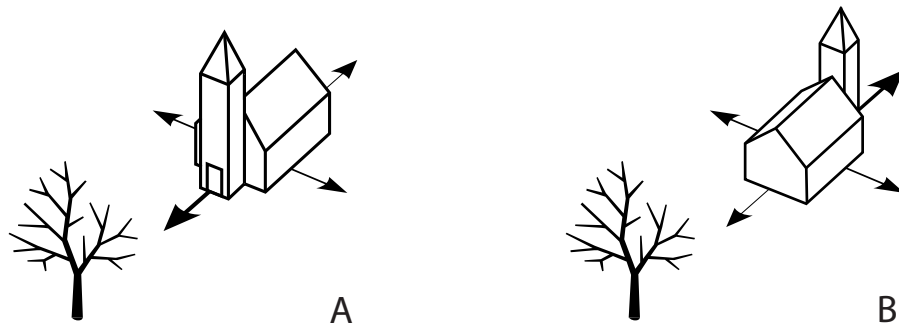
**Figure 9.2** Anchoring of Frames of Reference  
(anchoring of the intrinsic (panel A), relative (panel B), and absolute (panel C) Frames of Reference)

The anchoring of the three Frames of Reference leads to their differential truth values, under rotation, of aspects of the array. This is described in section 9.3.1. In addition to the three Frames of Reference, a fourth type of angular specification is found across languages, which is arguably not a true Frame of Reference. This fourth possibility is referred to as a Landmark-based expression, and is addressed in 9.3.2.

<sup>66</sup> The representation of the absolute Frame of Reference by the use of a grid suggests underlying Cartesian coordinates, while Levinson’s (2003) actually argues for polar coordinates. Notwithstanding this potential confusion, I have adopted this visual representation style to optimise visual distinguishability between the various Frames of Reference. For a discussion of different types of coordinate systems, I refer to Levinson (2003: Chapter 1).

### 9.3.1 Constancy under Rotation

The fact that each of the Frames of Reference is anchored in different aspects of the spatial array produces systematic differences between the truth values of each Frame. These semantic distinctions can be tested by identifying the conditions under which the description remains valid, despite changes in the orientation or locations of the entities in the scene. Consider Figure 9.3 below. In the left column, the initial Figure-Ground configuration of Figure 9.2 is repeated; on the right side, the Ground object (the church) is rotated 180° such that the tree is now at the back of the church. Now reconsider the Frames of Reference expressions provided earlier (repeated in the table in Figure 9.3). All three descriptions are valid for the left-hand image of the church and the tree. However, with respect to the right-hand image, where the church has been rotated by 180°, the intrinsic description of the scene “The tree is at the front of the church” has become invalid, as the tree is now at the back of the church. Notably, the other two Frames of Reference descriptions remain valid. The tree is still to the left of the church from the same external viewpoint, and the absolute description is also still accurate. The observation that relative and absolute Frames of Reference expressions remain valid after rotation of the Ground is here referred to as their constancy under rotation. The truth values of each of the expressions are summarised in the third column of the table below.

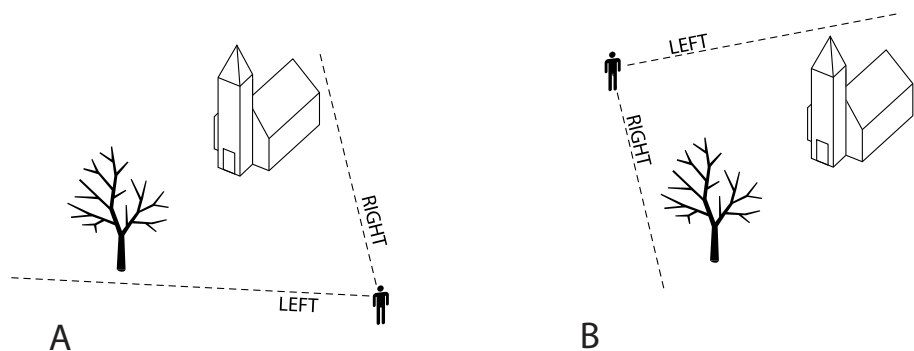


FoR	EXPRESSION	TRUTH VALUE	
		<i>Panel A</i>	<i>Panel B</i>
Intrinsic	'The tree is in front of the church'	True	False
Relative	'The tree is to the left of the church'	True	True
Absolute	'The tree is to the west of the church'	True	True

**Figure 9.3** Truth values under rotation of Ground object (the church)

The example above provides a way of distinguishing intrinsic Frame of Reference expressions from the other two Frames. That is, if the Frame of Reference expression becomes invalid after rotation of the Ground object, it must be an intrinsic one. As we shall see further on, these kinds of rotational tests can be used to identify the Frames of Reference in sign-spatial constructions (see section 9.6). A second rotational test reveals the difference between a relative Frame of Reference expression and an intrinsic or an absolute one by rotation of the external viewpoint around the scene. This is illustrated in Figure 9.4 below. The initial illustration is repeated on the left-hand side of the figure. On the right-hand side, the viewpoint - represented by the man - is now on the other side of the spatial array. Consider the expressions in the table in Figure 9.4, which are identical to the initial descriptions. Now the relative expression “The tree is to the left of the

church” has become invalid, i.e. the tree is now to the *right* of the church. However, the intrinsic and absolute descriptions remain accurate after rotation of the viewpoint around the scene.



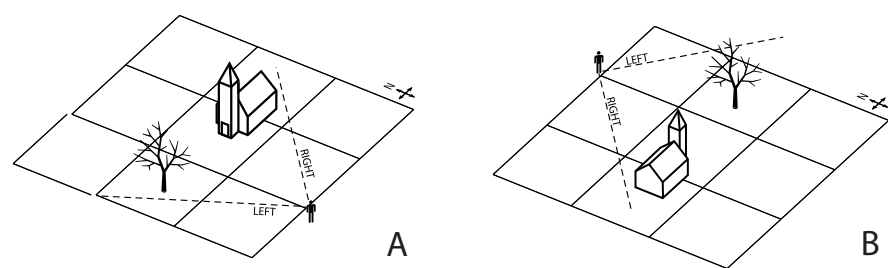
FoR	EXPRESSION	TRUTH VALUE	
		Panel A	Panel B
Intrinsic	'The tree is in front of the church'	True	True
Relative	'The tree is to the left of the church'	True	False
Absolute	'The tree is to the west of the church'	True	True

**Figure 9.4** Rotation of viewpoint around the Figure-Ground array

The tests above provide positive evidence for the identification of the intrinsic and relative Frames of Reference. When neither rotation of viewpoint nor rotation of the Ground changes the validity of the expression one might thus assume that an absolute Frame of Reference is applicable. There is however a third test that can be used to positively identify an absolute expression. That is, the absolute Frame of Reference becomes invalid if, and only if, the whole spatial array is rotated while all other factors are kept equal. Hence, the external viewpoint is rotated, along with the spatial array, while the orientation of the church with respect to the tree is kept constant. In effect, the church, the tree, and the viewpoint are picked up and rotated



by 180°. This is illustrated in the right-hand image of Figure 9.5 with respect to the base position (the left-hand image). While the intrinsic and relative expressions stay true, the absolute expression has become false, as the tree is now east of the church (see the table in Figure 9.5).<sup>67</sup>



FoR	EXPRESSION	TRUTH VALUE	
		Panel A	Panel B
Intrinsic	'The tree is in front of the church'	True	True
Relative	'The tree is to the left of the church'	True	True
Absolute	'The tree is to the west of the church'	True	False

**Figure 9.5** Rotation of the Figure-Ground array

Table 9.1 summarises the rotational characteristics of the Frames of Reference as described above. This overview not only reveals the differences between the three Frames but also shows occasional overlap. The intrinsic Frame of Reference is related to the absolute Frame in the sense that it does not change with a shift in the

<sup>67</sup> The reader will be aware that churches are built with the entrance towards the west, such that people entering the church approach the oriens ‘the light of the east,’ a reference to Jesus. For current purposes, however, I assume that this church does not have such a canonical orientation, and in fact, some modern church buildings are known to disregard this theologically-informed architectural rule in favour of building regulations and urban development schemes.

viewpoint, and because of this they are termed *allocentric* Frames (Levinson 2003:55). In contrast to the absolute and the relative Frame, an intrinsic description changes when the orientation of the Ground object is changed. Furthermore, the intrinsic Frame of Reference is the only Frame that is *orientation-free* in the sense that the orientation of the scene as a whole can be changed without needing to change the linguistic expression. Conversely, the relative Frame of Reference is anchored at the viewpoint, and thus the description must change along with the viewpoint's position.

	INTRINSIC	ABSOLUTE	RELATIVE
Constancy under rotation of:			
Whole array	Yes	No	No
Viewer	Yes	Yes	No
Ground	No	Yes	Yes
	Orientation-free	Orientation-bound	Orientation-bound
	Allocentric	Allocentric	Egocentric

**Table 9.1** Summary of rotational properties of the Frames of Reference  
(after Levinson 2003:53)

Importantly, the constancy under rotation of the relative and absolute Frames of Reference has also been shown to influence individuals' performance in spatial cognition tasks (Levinson et al. 2002; Majid et al. 2004; Haun et al. 2011). That is, speakers of languages with a dominant relative Frame of Reference (such as Dutch) tend to recall tabletop spatial arrays from an egocentric perspective. Conversely, speakers of languages with a dominant absolute Frame of Reference tend to recall the same arrays in a geocentric way. Chapter 11 presents the results of identical spatial memory tasks for Kata Kolok signers.

### 9.3.2 Landmark-based expressions

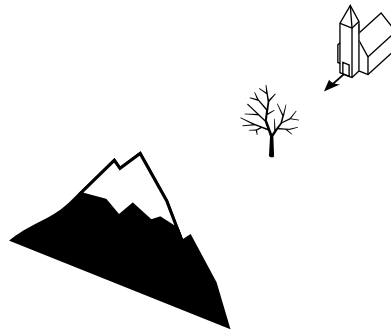
In addition to the three Frames of Reference described by Levinson (2003), a fourth linguistic possibility exists for providing an angular specification between a Figure and Ground object: the use of landmarks. Of course, landmarks can play a role within a description of any type of Frame of Reference; however, that is not what is meant here, because we are not talking about cases where a landmark that serves as a Ground within the intrinsic, relative, or absolute Frame of Reference is of the type “north of the mountain”. In these cases, the Ground happens to be a landmark within the spatial array. The second type – the type relevant here – is the use of landmarks to identify an angular direction from the Ground object. For clarity, I refer to the former use of a local landmark as Ground with a lowercase ‘l’, and the latter use within Landmark-based angular specifications with an uppercase ‘L’. What is meant exactly by Landmark-based angular specification of the relation between Figure and Ground object? <sup>68</sup>

Consider the example provided in Figure 9.6: “The tree is mountainward of the church”. In this expression, the tree is the Figure, the church is the Ground, and the angular specification given by the word *mountainward* relies on a local Landmark (the mountain). Landmark-based angular specifications select direction from the Ground based on a salient Landmark and from this facet a vector is projected to indicate the Figure object. This vector is represented by the single arrow in the figure. In contrast to true Frames of Reference, Landmark-based angular specifications are not coordinate systems, although they effectively describe the angle between the Figure and Ground. That is, there are no projected axes which constitute a grid of coordinates, and so, they need not form fixed oppositional pairs such as left-right, back-front, or east-west. Instead, the vector of a Landmark-based

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68 In the work by Terrill and Burenhult (2008) on Jahai and Lavukaleve, Landmark-based expressions that rely on inherent facets of objects are called ‘orientational’.

description points towards the Landmark. This difference is signified by the use of a single arrow, rather than four (which denote a coordinate system), and is described in more detail below.



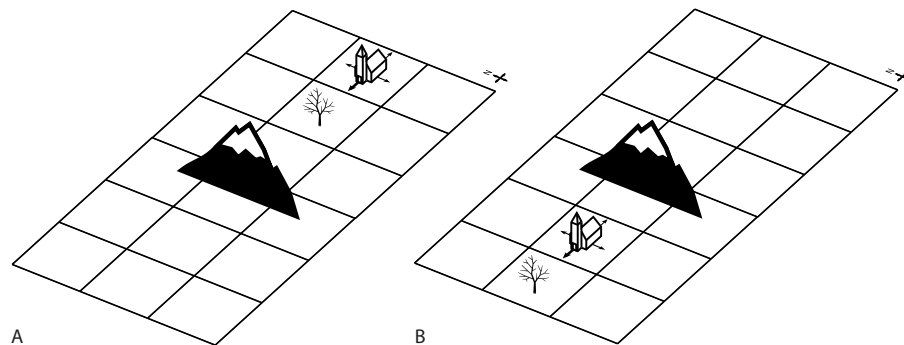
**Figure 9.6** Landmark-based descriptions select angular directions of the Ground based on a Landmark

At first sight, Landmark-based directional terms may show considerable resemblance to cardinal direction terms, which often find their origins in salient landscape features. Likewise, as Bohnemeyer and Stolz (2006:305) point out, they provide us with a system that is independent of the scene and its viewers. That is, similar to absolute constructions, Landmark-based expressions are allocentric and remain constant under rotation of the Ground and the viewer, unlike the other Frames of Reference. There are some crucial differences, however, and these are addressed in the sections below.

#### *Truth values of Landmark-based expressions*

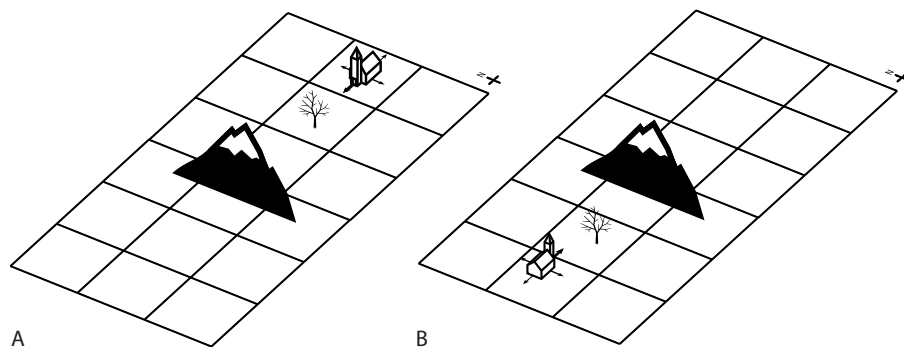
Despite the initial resemblance to the absolute Frame of Reference, the internal logic of Landmark-based descriptions has a close conceptual relationship with the intrinsic Frame of Reference. For example, Brown and Levinson (2009:455) point

out that you can walk around a Landmark (in this case the mountain), but you cannot walk around a cardinal direction (west). This observation relates to a fundamental difference between absolute and Landmark-based Frame of Reference descriptions pertaining to the type of spatial information committed to by the signer or speaker. That is, a Landmark-based expression does not describe the orientation of the Figure with respect to the Ground, but rather the orientation of the whole array with respect to the external Landmark (Terrill & Burenhult 2008). Compare the left and right-hand diagrams of Figure 9.7. While the absolute description “The tree is to the west of the church” remains accurate, a Landmark-based expression such as “The tree is mountainward of the church” may become false when the whole spatial array is relocated, as the array has been moved with respect to the Landmark. This reveals that Landmark-based expressions do not rely on fixed bearings, as cardinal direction terms do. Conversely, when the spatial array is relocated and rotated, the Landmark-based expression may remain valid while the absolute expression is now inaccurate (compare the diagrams and see the truth values in Figure 9.8). This comparison reveals that, unlike the absolute Frame of Reference, but on a par with the intrinsic Frame of Reference, the Landmark-based expression is orientation-free.



DESCRIPTION	EXPRESSION	TRUTH VALUE	
Landmark-based Absolute	'The tree is mountainward of the church'	Panel A	Panel B
		True	False
	'The tree is to the west of the church'	True	True

**Figure 9.7** Cardinal direction terms, unlike Landmark-based expressions, rely on fixed bearings



DESCRIPTION	EXPRESSION	TRUTH VALUE	
Landmark-based Absolute	'The tree is mountainward of the church'	Panel A	Panel B
		True	True
	'The tree is to the west of the church'	True	False

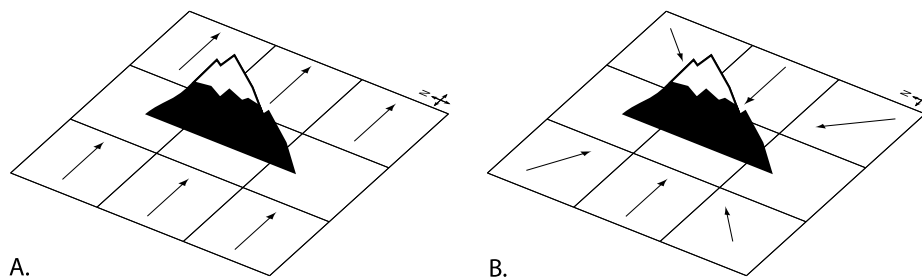
**Figure 9.8** Landmark-based expressions are essentially orientation-free  
(picture based on Figure 33.3 from Brown & Levinson 2009:456)

#### *Truth values and grid size*

Because Landmarks are usually geographically salient objects in the environment, they do not move about in the way that Ground objects do. Consequently, in any given context the difference between an absolute and Landmark-based expression may not be immediately clear. Brown and Levinson (2009:456) suggest the following thought experiment to illustrate this. If one were to put the Figure-Ground array in a box, does the Figure-Ground description tell you which way the box is orientated? For an absolute Frame of Reference expression the answer is yes, but this is not the case for a Landmark-based expression, nor for the intrinsic Frame of Reference. This effect has to do with the respective sizes of the spatial grid projected by Landmark-based expressions rather than the absolute Frame of Reference. That is, when considered on a global scale, the North pole could be considered a landmark, just like the mountain in Figure 9.9.

#### *Gradience of Landmark-based expressions*

Given the fact that virtually any object salient to the discourse may serve as a Landmark in spatial descriptions, Bohnemeyer and Stolz (2006) note that Landmark-based expressions are heavily dependent on the context of the utterance, and often require gaze direction for the correct interpretation of the Figure's orientation. In my view, this property of Landmark-based descriptions reveals a fundamental difference between Landmark-based systems and Frames of Reference in general. That is, the three linguistic Frames of Reference identified by Levinson (2003) often rely on a fixed set of lexical oppositions that project angles from the Frame's anchor. In contrast, the vectors of a Landmark-based system converge towards the Landmark. Landmark-based descriptions are essentially analogue in that they can select any direction from a Ground for which a salient Landmark can be identified. This difference is captured schematically in Figure 9.9.



**Figure 9.9** Schematic differences between an absolute Frame of Reference (panel A) and Landmark-based angular specifications (panel B)

#### *Degree of conventionalisation*

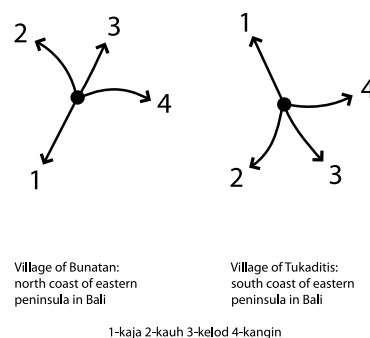
The distinction between Frames of Reference and Landmark-based angular specifications described above is not always clear-cut. In many languages, including spoken Balinese, the absolute grid system is etymologically derived from a Landmark-based system. For example, in Lao the terms for North and South have active meanings as “upstream” and “downstream” (Enfield 2007:394-6). In other words, while cardinal direction terms are often derived from the same geographically salient object and are thus in a sense conventionalised, Landmark-based expressions need not be. Furthermore, Landmark-based expressions can rely on any object within the discourse context that effectively describes a scene. In data from Tzeltal, for instance, speech participants served as Landmarks. Similarly, in Jahai, the Landmarks employed in the Man and Tree task are consistently ad hoc and are often formed by objects in proximity to the setting of the task (Terrill & Burenhult 2008). Unlike the cardinal directions of truly absolute systems, Landmark-based descriptions can thus be convenient but non-conventionalised solutions for describing a Figure-Ground array (Bohnenmeyer & Stolz 2006; Terrill & Burenhult 2008). Bohnemeyer and Stolz label Landmark-based expressions “pseudo-absolute” for the reasons stated above. Section 9.3.3



below reviews the evidence that the spoken Balinese direction terms are best characterised as a Landmark-based system.

### 9.3.3 Landmarks in the Balinese language and culture

The Balinese language has four oppositional terms: *kaja*, *kangin*, *kelod*, and *kauh*, often incorrectly translated as ‘north,’ ‘east,’ ‘south,’ ‘west’ (Mishra & Dasen 2010:78). The terms *kangin* and *kauh* identify the directions of the locations of sunrise and sunset on the horizon. *Kelod* and *kaja* can be analysed as *ke lau* ‘seaward’ and *ke aja* ‘mountainward’; they are based on Landmarks, namely the sea and the volcanoes central to the islands (Wassmann & Dasen 1998). However, the actual direction indicated by *kelod* and *kaja* changes depending on the location of the speaker. This is illustrated by Figure 9.10, which displays two data points from a study by Wassmann and Dasen (1998).



**Figure 9.10** Balinese Landmark-based system  
(based on Figure 2 of Wassmann and Dasen 1998:698)

Wassmann and Dasen visited multiple villages in the eastern peninsula of Bali and asked individuals to point out the four directions. Figure 9.10 shows the directions pointed at by inhabitants of two Balinese villages to indicate *kaja*, *kangin*, *kelod*, and *kauh*. The figure shows that the *kaja*-*kelod* axis, indicated by the numbers 1

and 3, is totally inverted even though the villages are only 10 kilometres apart. These findings can be extrapolated to the whole of Bali; when one is in the south, speakers of Balinese point in a direction completely opposite to the one used when uttering the word *kaja* in the north. Figure 9.10 makes clear that the *kangin-kauh* (numbers 2 and 4) axis is also different between the villages, even though they are supposed to refer to the fixed locations of sunrise and sunset. Furthermore, the overall results of Wassmann and Dasen's study show that the directions that individuals indicate change gradiently depending on where on the island one lives (Wassmann & Dasen 1998:698). These gradient shifts in particular are indicative of a Landmark-based system, and are inconsistent with an absolute grid (see also Figure 9.9 on p. 251). The Balinese spatial reference system has often mistakenly been called absolute. It is one of the cases where – due to the sheer size of the configuration – an absolute system becomes hard to distinguish from a Landmark-based description. For current purposes, both options – a truly absolute Frame of Reference and a Landmark-based system based on geographically salient objects – will be subsumed under the notion of *geocentricity*.<sup>69</sup> The main reason for the conflation of these categories under this term is that the linguistic and cognitive data collected throughout Part IV do not effectively distinguish between these two types of Figure-Ground descriptions. Section 11.4 makes suggestions on how the distinction could be tested by collecting additional data.

As described in section 1.1, the Balinese geocentric direction system is not a mere quirk of language, but is sustained in various cultural practices such as architecture, child-rearing and religion. For example, the villages, temples, and houses are built with reference to a spatial plan with the entrance facing *kelod* and the exit facing *kaja* (Covarrubias 1950:265). Moreover, the family temple in a

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69 Levinson (2003) subsumes the absolute Frame of Reference and Landmark-based systems under absolute systems. In the work on Balinese gesture by Wassman and Dasen (1998; 2006) the term geocentric is more common.

house is always built in the *kaja/kangin* corner, as this is the most sacred direction. Conversely, the animals and rubbish are found in the least sacred corner: *kelod/kauh* (Wassmann & Dasen 1998:693). Children are taught to be attentive to geocentric directions from an early age; for example, parents teach them that the appropriate direction to rest their heads is *kauh*. Balinese children acquire the cardinal direction terms at an early age (Mead & Bateson 1942:6; Mishra & Dasen 2010:113). Geocentric space is part of a larger cultural construct linking body parts, gods, colours, and numbers to the cardinal directions (Covarrubias 1950:76; Wassmann & Dasen 1998). Apart from these cultural elaborations, the Balinese co-speech gesture system has also been shown to exhibit parallels to this spatial system in that it is motivated geocentrically as opposed to egocentrically (Wassmann & Dasen 2006; Dasen & Mishra 2010:109-162).

While the absolute Frame of Reference is linguistically and culturally dominant in Bali, the other two Frames of Reference are also attested at the ethnographic level. As in other parts of Indonesia, Balinese culture holds a strong left-hand taboo and children as young as 12 to 18 months are often told to use their right hand by the use of intrinsic terms (Dasen & Mishra 2010:84). Notably, these intrinsic Frame of Reference expressions are not projected onto other objects to describe spatial arrays. Furthermore, the majority of the Balinese population is bilingual in Balinese and Bahasa Indonesia - a language with a dominant relative Frame of Reference. All Balinese children are taught Bahasa Indonesia as soon as they enter the primary school system, and their co-speech gestures shift from predominantly absolute to a mixture of relative and absolute gesture accordingly (Dasen & Mishra 2010:133). Given the linguistic and cultural dominance of the Balinese spatial system, however, as well as the immersion of Kata Kolok within this culture, it is hypothesised below that Kata Kolok, too, will exhibit properties of a geocentric system.

#### 9.4 *Geocentric Hypothesis*

It is clear that Balinese culture emphasises geocentric directions in numerous ways. Moreover, many Kata Kolok signers are hearing individuals whose primary language is spoken Balinese (see section 2.2.2 for details). For this reason, spoken Balinese could have had an influence on the formation of spatial structures in the sign language. Further, the co-speech gestures of these hearing villagers - the gestural input that Kata Kolok signers must have received from the language's first inception - are predominantly geocentric (Wassmann & Dasen 2006; Dasen & Mishra 2010: 109-162). Deaf Kata Kolok signers may have picked up on these gestural representations of spatial arrays and re-used them in the creation of sign language.<sup>70</sup> Finally, there are some reports that Kata Kolok employs an "absolute" pointing system (Zeshan 2006a; Marsaja 2008:162; Perniss & Zeshan 2008). On this basis, Kata Kolok can be said to have been submerged in a geocentric spatial system from its inception, and for this reason, it is hypothesised here that, on a par with spoken Balinese, Kata Kolok will exhibit characteristics of a geocentric spatial reference system in Figure-Ground constructions as well. I refer to this hypothesis as the Geocentric Hypothesis. The following section demonstrates how the use of sign-spatiality in signed spatial descriptions complicates the implementation of Levinson's Frames of Reference.

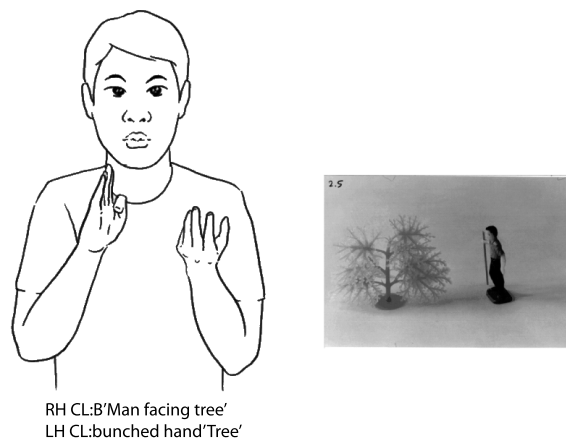
#### 9.5 *Sign-spatial significance*

In contrast to the spatial structures of spoken languages, spatial descriptions in the gestural modality do not normally rely on lexical signs that label the angle between Figure and Ground. Some sign languages have a limited set of lexical signs that

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70 A similar influence of co-speech gesture on sign language structure has been argued to have taken place in American Sign Language e.g. in the case of role shift (Poulin & Miller 1998; McClave 2001), and in American Sign Language, Catalan Sign Language, French Sign Language, and Italian Sign Language for agreement verbs (Wilcox 2004).

mean left/right, front/back, or north/south/east/west to describe Figure-Ground constructions (see Perniss 2007:113f on German Sign Language), but Kata Kolok does not have them at all. Rather than such lexical signs, Kata Kolok signers use simultaneous classifier constructions with the Figure and the Ground object projected on each of the signer's hands. Figure 1.2, repeated here as Figure 9.11, displays a typical example of such a simultaneous classifier construction describing the relation of a man to a tree. This preference to describe spatial arrays by the use of simultaneous classifier constructions is found across sign languages (Meier 2002; Perniss 2007:130; Özyürek et al. 2010). Section 4.5.1 dealt with the use of simultaneous classifier constructions for other functions.



**Figure 9.11** Simultaneous classifier construction

The first question that arises is in what way do Kata Kolok signers and their interlocutors take into account the sign-spatial properties of classifier signs? Any sign-spatial expression potentially carries information related to any Frame of Reference, and so the interlocutor of a signer has to recognise which perceived

spatial information is relevant to the interpretation of the utterance. Conversely, the signer him/herself is faced with the potential problem of how to display commitment to spatial facets of his/her spatially-produced signs, if at all. He/she may also want to suppress information when he is not committed to his own viewpoint as being relevant to a description of the scene. How do signers solve this semantic puzzle in both production and perception? When signers are describing space using a simultaneous classifier construction, could the sign-spatial descriptions be interpreted as defining a spatial arc between these two elements meaning 'right of,' 'north of,' or 'in front of' in a similar way to spoken language Frame of Reference expressions?

The spatial typology laid out above has been proposed to underlie all human languages, and also non-linguistic memory, spatial inference, wayfinding, and co-speech gestures (Chapter 7; Levinson 2003; Majid et al. 2004). Sign languages, therefore, constitute the ultimate test case to evaluate the claim. That is, despite the semiotic differences between signed and spoken expressions, signed expressions may parallel the conceptual distinctions that underlie the three Frames of Reference and Landmark-based systems. When applying the Frames of Reference in the analysis of sign language data, the central issue at hand is that, since all signs are essentially spatial entities themselves, their sign-spatial relationships can in principle be described in any Frame of Reference. I will refer to this theoretical issue as sign-spatial significance. There are three interdependent reasons why signed expressions are essentially ambiguous with respect to any type of angular specification. First, a potential viewpoint - as in the relative Frame of Reference - is evoked by the signer's own view of the signs.<sup>71</sup> Second, signs are formed by

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71 Note, however, that the viewpoint of the signer onto his/her own signs does not necessarily have to be egocentric, that is to say the viewpoint can in principle represent any origo from which a signer decides to take a perspective, for example, by role shift (see section 7.5).

body parts which have inherent asymmetries. The hands are asymmetrical in having different sides: bottoms, tops, fronts, and backs.<sup>72</sup> Similarly, the signer's own body has an inherent front and back. These asymmetrical features of the body are recruited to map onto inherent (but culturally and functionally assigned) features of entities (Emmorey 2002; Perniss 2007:72f). These projected facets are subsequently recruited for an interpretation in intrinsic terms. Third, an absolute interpretation parallel to cardinal directions is available, in principle, as signs exist in real space as well. The application of each of the Frames of Reference to simultaneous classifier constructions is considered in sections 9.5.1-9.5.3 below.

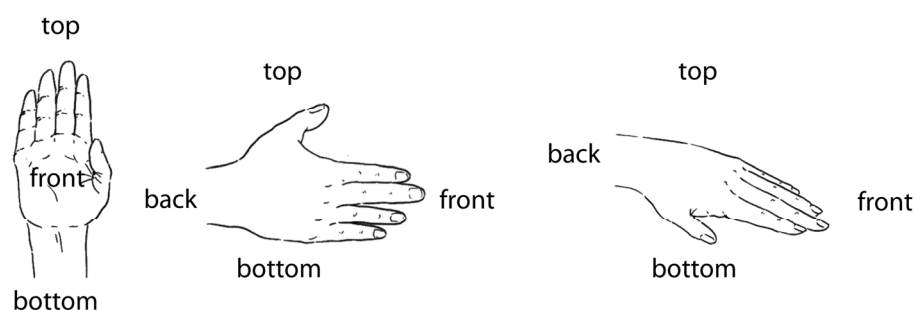
#### 9.5.1 The Intrinsic FoR: intrinsic features of the hands

An intrinsic Frame of Reference is anchored in the physical properties of the Ground object. The assignment of such features remains dependent on the perceptual and functional characteristics of the entities. In other words, if the objects referred to by the entity classifiers do not have distinct perceptual features themselves, the asymmetries of the hands will not be relevant. In Kata Kolok entity classifiers, the projection of features relies on the orientation of the hand. This is illustrated in Figure 9.12 below. When denoting an upright entity the hand is oriented vertically; the finger-tips represent the head or topside of the represented entity, the back of the hand represents the back of the entity, and the palm represents the front side or face. The base of the hand at the wrist represents the feet or the downside of the entity. This type of mapping between the inherent feature of the entity and the asymmetries of the hand is represented in the leftmost image. In the middle image, the hand is used with the palm facing inwards, as when reflecting the shape of a motorbike, for instance. In this case the thumb-side of the hand represents the topside and the pinky-side represents the downside or

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<sup>72</sup> Hands are in fact not just asymmetrical, but three-dimensional *enantiomorphs* - identical objects which have been flipped in a fourth dimension (Levinson & Brown 1994).

feet of the entity. The fingertips refer to the front side or head of the entity. The base of the wrist is the back of the entity. In this case the palm and back of the hand represent the sides of the object. Finally, in the rightmost image of Figure 9.12 the entity classifier is produced with the palm facing downward. With this orientation, the back of the hand represents the top of the entity (e.g. the roof of the car), while the palm is the bottom side.<sup>73</sup>



**Figure 9.12** Orientation and the intrinsic features of classifier hand shapes

Importantly, the interpretation of an entity classifier in intrinsic terms is afforded by the canonical position of the hand in relation to the ground, and is not dependent solely on orientation, but also on the nature of the referent and the inherent features of the hand. For example, an entity classifier referring to a human being is normally presented by a full hand oriented upward as in the left-most image of Figure 9.12, but with the forearm pronated will retain the features as they

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<sup>73</sup> The assignment of Frame of Reference information to Kata Kolok entity classifiers is reminiscent of the adaptation of Tzeltal body-part terminology to other objects (Levinson 1994), but more research is needed to explore the nature and extent of the similarities between these two languages.



were assigned originally in its canonical upright position. The assignment of intrinsic features to the hands in the use of entity classifiers is used as a heuristic tool for the encoding of intrinsic information in simultaneous classifier constructions in the analysis of the Man and Tree game in section 11.2.3.

#### 9.5.2 The Relative FoR: viewpoint

A relative Frame of Reference is anchored in an external viewpoint. In signed expressions, such a viewpoint is naturally evoked by the signer's own view of his/her signing space. We know that this viewpoint need not be egocentric, as signers may project any referent onto their bodies using role shift. The signer's body and viewpoint thus effectively represent the deictic origo (see Part III of the thesis). Nevertheless, given the iconic affordances of the gestural modality, the interpretation of simultaneous classifier constructions in terms of a relative Frame of Reference might in a way be unavoidable. In other words, because the signer and the signs are spatial entities themselves, how do we know that they are not co-relevant, i.e. part of the same spatial description? This question is crucial to the analysis of signed data in terms of Frames of Reference, because the signer's (projected) viewpoint may determine the spatial relationship between Figure and Ground and thus evoke a relative Frame of Reference interpretation. The findings through the following chapters show that, unlike users of other sign languages, Kata Kolok signers do not generally commit to their own viewpoint as being relevant to the signed utterance.

#### 9.5.3 The Absolute FoR: absolute directions

In spoken languages, an absolute Frame of Reference is anchored in fixed bearings, independent of the viewer, and independent of the properties of the Figure and Ground object. Although the use of such cardinal direction terms has been described for American Sign Language, the sign-spatial manifestation of their use reveals that they are used as relative terms (Perniss 2007:61). Take the American

sign NORTH for instance; although this lexical sign refers to the cardinal direction ‘north’ by use of the N-handshape, it can point in any direction depending on the viewpoint and spatial format that a signer wishes to express. In other words, the sign-spatial properties of the sign need not adhere to an absolute cardinal grid. Although there are no lexical signs for the cardinal directions in Kata Kolok, there are a few examples of signs having sign-spatial properties that must adhere to the geographic locations concerned. The best example of this is the sign for MORNING which is always produced in the eastern corner of the signing space (see p. 215).

How can we know whether the signer is committing to a specific viewpoint on the scene, as is required in a relative Frame of Reference expression? How do we know whether a signer is not committed to any viewpoint but rather adhering to cardinal directions? How do we know whether the signer commits to the orientation of entity classifiers in terms of an intrinsic Frame of Reference? In other words, how can we identify the sign-spatial significance of a signed utterance? Section 9.6 argues that one way to answer this question is through a set of linguistic elicitation tools and cognitive tasks from the so-called rotation paradigm. The results from these heuristics techniques, presented in chapters 10 and 11, indicate that Kata Kolok signers generally demote orientation information in terms of a relative and an absolute Frame of Reference, while preserving scene-internal cues in simultaneous classifier constructions as ascribed to the intrinsic Frame of Reference.

### *9.6 The Rotation Paradigm*

The differences between the three Frames of Reference become clearest in their constancy under rotation as summarised by Table 9.1 on p. 245. Although Frames of Reference can be tested using the rotation paradigm in spoken languages, the use of sign-spatial constructions in the gestural modality complicates matters a

good deal. In spoken languages, individuals use lexical items such as north, in front of, or right. Whether the truth value remains valid after rotation or not becomes apparent from either the inappropriateness of a certain term, or the rewording in the spatial description. For example, after rotation round the scene the description “the tree is left of the church” is reworded to “the tree is right of the church”. For sign languages, however, the Frames of Reference descriptions are based on the sign-spatial relationship between a Figure, a Ground, and potentially an external viewpoint, and although the signer’s left and right hands may represent different objects in both description, a literal rewording does not take place. This raises the issue of what constitutes a constant sign-spatial relationship.

One way to test whether the signed description remains constant after rotation of the Ground, the Viewer, or the whole array, is by conducting tests from the rotation paradigm (Pederson et al. 1998; Levinson 2003; Senft 2007). These tasks were originally designed to determine the structure of mental representations of spatial arrays. Since sign-spatial constructions do not carry labels, but rather convey spatial information implicitly through the orientation and placement of signs in the signing space, elicitation through these means is particularly suited to the goals of this study. The central idea behind the rotation paradigm is simple. The researcher first asks a participant to view a spatial array, and then the participant is repositioned to face a different direction, before the participant is asked to reproduce the scene as he/she recalled it. In the tasks conducted here, however, the participants were asked to retell stories after such rotations. Chapters 10 and 11 present results from data that were collected by applying the rotation paradigm to narratives and structured language elicitation games, respectively.

For an intrinsic expression, a constant sign-spatial relationship is defined as the orientation between (classifier) signs that represent the Figure and the Ground object. This orientation should not change when either the whole array or the viewer has changed position. For a relative expression, a constant sign-spatial

relationship is defined with respect to the signer him/herself: whether the classifier signs are still to his/her left or right hand side after rotation of the Ground object has taken place. Moreover, the description must change when the viewer or the whole array is rotated such that an 180° rotation results in a left-right transposition. Finally, for an absolute expression, the sign-spatial relationship of the classifier signs ought to remain constant with respect to fixed bearings. This means that when the whole array is rotated, the description changes with respect to the signer's own body, but not to absolute locations. Note that the way in which a constant sign-spatial relationship has been described leaves the possibility of a combination of two Frames of Reference, where both the intrinsic and the relative Frames of Reference, or both the intrinsic and the absolute Frames of Reference, can be satisfied (see also Emmorey 1996). By contrast, a combination of the absolute and relative Frames of Reference cannot occur within a single expression. The simultaneous expression of multiple Frames of Reference within a single Figure-Ground construction has previously been described by Emmorey (1996) for American Sign Language and for German Sign Language by Perniss (2007:149), but in spoken languages the combined use of different Frames of Reference is only attested in sequential constructions (Pederson et al. 1998).

### *9.7 Summary and discussion*

Section 9.3 has familiarised the reader with the notion of Frame of Reference as the angular specification between a Figure and a Ground object in the description of spatial arrays. Three Frames of Reference can be distinguished based on their semantic anchors: the Ground, the viewpoint, or fixed bearings (Levinson 2003:41ff). The relevance of these anchors becomes particularly clear in their constancy under rotation (Levinson 2003:52f). In addition to the three Frames of Reference, languages may also deploy Landmark-based expressions to describe spatial arrays (Bohnenmeyer & Stolz 2006; Brown & Levinson 2009). Previous

research indicates that Balinese people show a strong preference for geocentric notions of space as evidenced in everyday language use, co-speech gesture, socialization of infants, and religious and cultural practices (Mead & Bateson 1942; Covarrubias 1950; Wassmann & Dasen 1998, 2006). Furthermore, previous work reports that Kata Kolok signers may construct discourse according to ‘absolute’ locations (Zeshan 2006a; Marsaja 2008:162-4; Perniss & Zeshan 2008). The present hypothesis, which shall be referred to as the Geocentric Hypothesis, is that Kata Kolok Figure-Ground constructions too may display geocentric characteristics. In order to assess whether Kata Kolok signers commit to any, or multiple Frames of Reference, the following chapters draw upon a set of linguistic elicitation tools and cognitive tasks from the rotation paradigm (Senft 2007).

There are, however, four differences between Frames of Reference in spoken and signed languages that are worth pointing out. First, contrary to Frame of Reference expressions in spoken languages, sign-spatial constructions are not normally based on lexical labels denoting each direction. Rather, they rely on the interpretation of sign-spatial properties of the signed description, and for this reason the relevant Frame of Reference cannot be identified without careful rotational testing. A second difference between Frames of Reference in spoken and signed expressions arises from the implementation of the anchor of the Frames of Reference in the signer’s viewpoint, facets of entity classifiers, and fixed bearings. Because the sign-spatial characteristics of entity classifiers can be manipulated partly independent from the other elements, the intrinsic Frame of Reference can be used simultaneously with the other two Frames of Reference without contradicting them. Specifically, while the relative and absolute Frames of Reference are mutually exclusive, either Frame can be combined with the intrinsic Frame of Reference (see also Emmorey 1996; Perniss 2007:165; Arik 2008). For example, a signer may produce a simultaneous classifier construction in which he is committed to the fact that the two figures are facing each other, *and* positioned

on the east-west axis. While the simultaneous expression of standing and facing information is not attested in spoken languages, multiple Frames of Reference can occur in the sequence of utterances that describe a single Figure-Ground relation (Pederson et al. 1998). The third difference is that in many spoken languages the relative terms are etymologically derived from the intrinsic ones; the intrinsic terms to indicate the features of objects have been projected from the viewer's body onto the objects. However, in sign languages it is not obvious that there is such an ontological relationship between relative and intrinsic terms. Rather, the indication of intrinsic characteristics is based on the features and asymmetries of the hands themselves. Fourth, while sign-spatiality features across spatial descriptions in sign languages, Figure-Ground constructions in spoken languages clearly constitute a separate class of spatial terms (Levinson 2003:66).<sup>74</sup> Topological relations, for instance, also rely on the sign-spatial properties of simultaneous classifier constructions in expressions such as “The cup is on the table”. More research is needed to identify the differences and similarities between various sign-spatial constructions in sign languages to see how they relate to the categories of spatial semantics that stem from spoken language typologies. Moreover, it is unclear at present to what extent Levinson’s (2003) spatial typology is appropriate and adequate to described sign language data given the affordances of sign-spatiality. Kata Kolok presents a particularly challenging case study because this sign language has been reported to exhibit a fundamentally different spatial organisation to other sign languages.

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<sup>74</sup> As mentioned in section 1.1 both in the case of sign-spatial mapping and spoken words, however, spatial meanings are extended and shared with non-spatial domains.

## ***10 Simultaneous classifier constructions in narratives***

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### *10.1 Overview*

Simultaneous classifier constructions are the main construction for expressing Figure-Ground relations in Kata Kolok, and they are based on sign-spatiality. Therefore, they lie at the heart of addressing the issue of sign-spatial significance (section 9.5). To study sign-spatial interpretation of simultaneous classifier constructions, I collected narrative data from Kata Kolok signers in which spatial information central to the story was conveyed through simultaneous classifier constructions. These stories were then recorded by the signers on a different occasion when facing in a different direction, to determine whether their sign-spatial properties remained constant with respect to a viewpoint, to the inherent properties of the Ground, or to fixed bearings (section 10.2). Due to the design of the data collection, only the relative and the absolute Frame of Reference, but not the intrinsic Frame of Reference, were systematically tested. The data analyses in section 10.3 show that signers have both absolute and relative options available, and these analyses do not lead to a conclusive answer to the question of whether the relative or absolute Frame of Reference predominates Kata Kolok discourse. Section 10.4 concludes by identifying some of the methodological issues that were encountered and suggests that additional, systematically elicited data is required in order to rigorously test the Geocentric Hypothesis. This observation leads to the structured elicitation games and analyses presented in chapter 11.

### *10.2 Data collection*

Bengkala has a rich ‘oral’ tradition. Kata Kolok signers, and Balinese speakers as well, regularly gather to tell the stories of (deaf) ghosts, magical villagers, the colonial history of Bali, foreigners visiting the village, and dramatic traffic accidents. From these stories a subset of three narratives was selected in which

simultaneous classifier constructions conveyed crucial spatial information. Two of these stories are motorbike accidents that had occurred in the last five years, and a third story has been handed down from father to son about tunnels that were dug during the Second World War after the Japanese invasion of Bali. Three different signers each told their story on two different occasions at different locations within the village, and oriented towards different cardinal directions. Participants were invited to the recording sessions and instructed to sit facing a certain direction, but were not informed about the purpose of the study. The idea of asking signers to retell their stories after rotation stems from video evidence that speakers of Guugu Yimithirr, an aboriginal language with a dominant absolute Frame of Reference, may adjust their co-speech gestures according to the absolute bearings of events when narrating (Haviland 1993, 1998; Levinson 2003:5). Notably, while this methodology can distinguish between the relative and absolute Frame of Reference, assuming certain premises, it does not rigidly test the intrinsic Frame of Reference, as the orientation of the Ground object is not systematically varied.

The three narratives analysed in 10.3 were the only successful attempts to obtain naturalistic data for systematic comparison, and the data set is therefore limited. The main reason why I was unable to acquire substantial data sets is due to the relative infrequency of events within these stories that could be verified as taking place along fixed bearings. I also aimed to elicit spatial structures by undertaking a road trip with a dozen Kata Kolok signers and having them retell the trip on various occasions facing in different directions. Although these road trip stories contain spatial descriptions based on role shift, absolute pointing, and verbs of movement, they included few simultaneous classifier constructions, and have been omitted from the current analysis.<sup>75</sup>

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<sup>75</sup> More information about absolute pointing, verbs of movement, and role shift in Kata Kolok can be found in sections 6.4, 6.5, and 7.5 respectively.



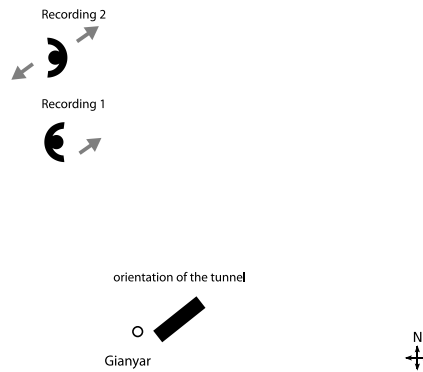
### *10.3 Frames of Reference in Kata Kolok narratives*

The sections below present the analysis of the data described in 10.2, which indicates that Kata Kolok signers can adopt both the absolute and the relative Frame of Reference to construct spatial discourse.

#### *10.3.1 Absolute sign-spatiality in Kata Kolok narratives*

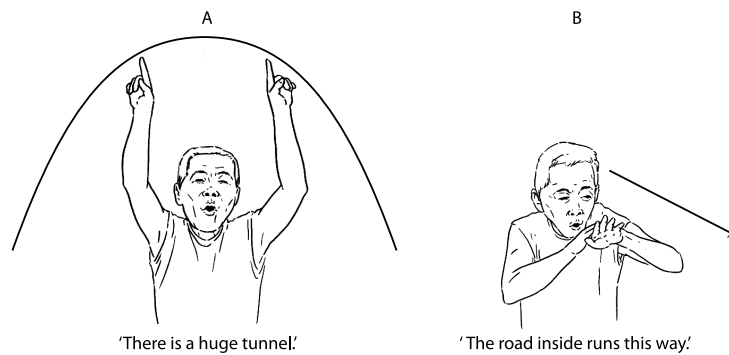
The first narrative is a story that a signer, who is now the ‘deaf leader’ of the village, learned from his father. The event took place during the Second World War when the Japanese invaded Bali. During this period, Balinese men were sent to do forced labour, digging tunnels in Gianyar (a region in the south-east of Bali). The signer discusses the inhumane treatment that the Balinese received during this period. The narrative also contains spatial constructions, on which I focus here. The same signer is facing east in the first recording and west in the second. The recordings were made at different locations within the village. Both locations were north-west of the location of the narrated event, which is approximately 75 kilometres away from the village. Figure 10.1 presents a schematic overview of the location of the Narrated Event and the recording sessions, and the orientation of the tunnels. The grey arrows represent the directions of the signs describing the tunnel. These signs will be described in detail below.

During the first recording session, the signer is facing east. He describes the tunnel by tracing its shape in the air using his index fingers (see panel A of Figure 10.2). This description is followed by a simultaneous classifier construction that is formed by two B-hands. The top hand (his right hand) represents the roof of the tunnel and his left hand represents a road running north-east through the tunnel as the sign was produced in a north-eastern direction (see panel B of Figure 10.2).



**Figure 10.1** The tunnel at Gianyar

Schematic overview of the location of the Narrated Event, locations of the recording sessions, the facing directions of the signer, the orientation of the tunnel, and the sign-spatial directions of the signs



**Figure 10.2** Tunnel narrative - signer facing east

During the second recording session, the signer is facing west as he tells the story. He refers to the tunnels again by tracing a semi-circle in the neutral signing space with both hands, and then points towards the true location of Gianyar, to his right, and to the south of Bengkulu. This construction is shown in the top two stills of

Figure 10.3. The signer tells how many of the men were sent there to dig tunnels through which runs a road. In conveying the spatial orientation of this road through the tunnel, the signer uses another simultaneous classifier construction. His left hand represents the road with a pronated B-hand, and his right hand represents the roof of the tunnel, shaped with a slight curve.

In the bottom two stills of Figure 10.3, the signer continues by describing the orientation of the tunnel. When the road is first mentioned, it is running in a north-east direction, parallel to direction of the tunnel described in Figure 10.2 (panel(c) of Figure 10.3). At the second mention of the tunnel (panel (d) of Figure 10.3) it runs in a south-west direction. This information may seem contradictory. However, since a tunnel has two ends, both descriptions may be true, depending on the end of the tunnel from which the orientation of the tunnel is described.

The spatial description of the road running through the tunnel in the bottom-left still is particularly remarkable, as the signer twists his torso and produces the signs towards the space behind him. The signer goes out of his way to provide an accurate description in geocentric terms. After visiting the site, which is still there, I can confirm that his description is consistent with the directions of the tunnels as they are today. The sign-spatial characteristics of the simultaneous classifier construction that represents the tunnels are thus consistent with the absolute direction of the tunnels. While this type of “absolute” directionality has been reported for the co-speech gestures of speakers of languages with a dominant absolute Frame of Reference (Haviland 1993, 1998; Levinson 2003:264-6), it has not been reported in the literature of spatial description of sign languages until now. This example demonstrates that Kata Kolok signers are attuned to picking up the absolute orientation that is available in sign-spatial constructions even when they do not have first-hand experience of the Narrated Event.



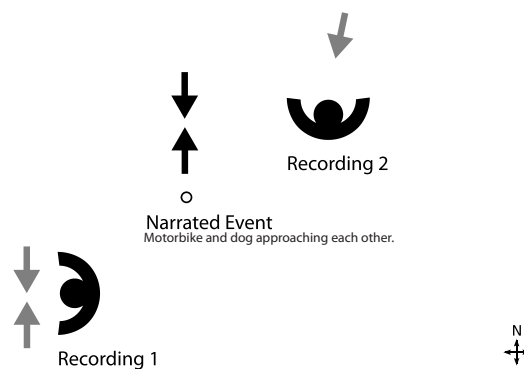
**Figure 10.3** Tunnel narrative - signer facing west

*SD's motorbike accident told facing west*

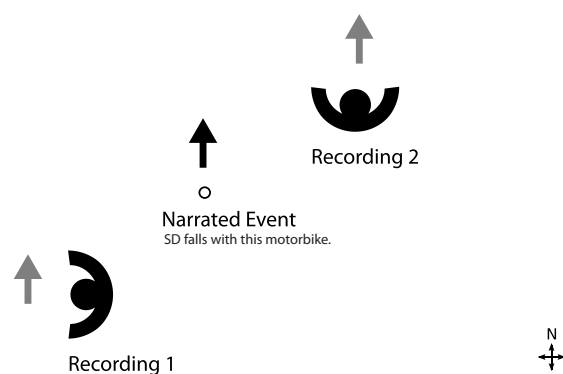
The second narrative that I will discuss is an anecdote told by a deaf woman about her husband (SD), who was on a motorbike when he hit a dog in the street. She signs the story on two different dates, ten days apart. At the time of the first recording, the signer is facing west at a location a few hundred metres south-west of the narrated event. During the second recording session, she is facing north, a

few hundred metres north-east of the location of the accident. The figures below present a schematic overview of the locations of the Narrated Event with respect to both recording locations, the facing directions of the signer (the black figure) as well as a schematic representation of the two core spatial events (represented by the black arrows) and the sign-spatial directions of the signs (represented by the grey arrows). Figure 10.4 gives an overview of SD approaching the dog; his subsequent fall is illustrated by Figure 10.5.

On both occasions the signer describes the same collision. The stills in Figure 10.6 display the main spatial constructions of the narrative. In this recording of the story, the signer is asked to give a narrative account of her husband's accident. She signs that SD was riding a motorbike when he saw a dog in the street. The dog and SD are heading towards each other, SD travelling south and the dog heading in a northerly direction (panel A of Figure 10.6). Then, after they have collided, SD falls in a northerly direction (panel B of Figure 10.6).

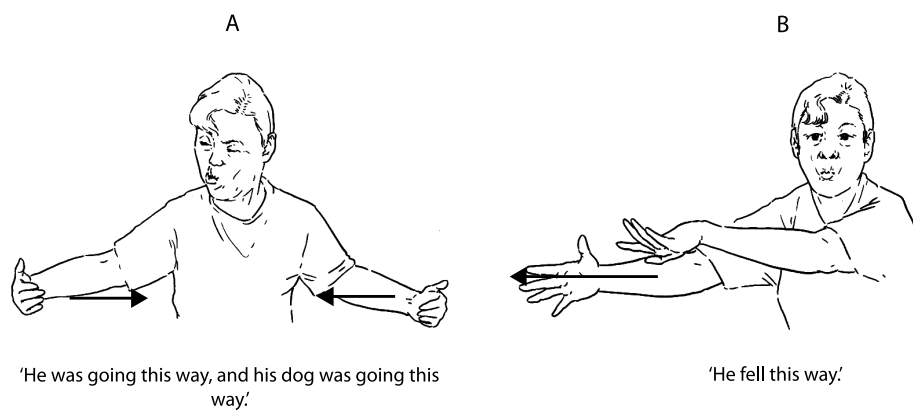


**Figure 10.4** The motorbike and the dog approaching each other  
Schematic overview of the location of the Narrated Event, locations of the recording sessions, the facing directions of the signer, the movement direction of the event, and the sign-spatial directions of the signs



**Figure 10.5** SD's fall

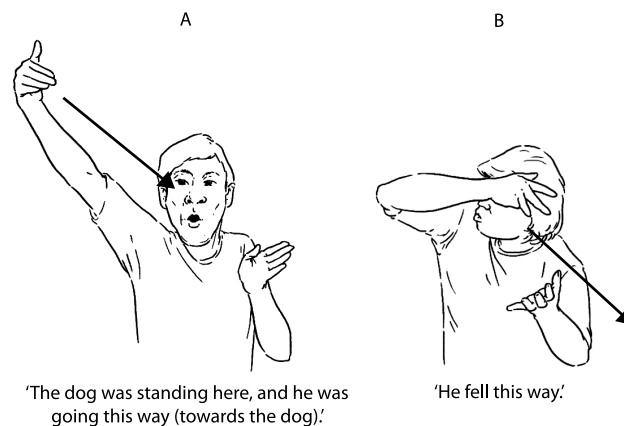
Schematic overview of the location of the Narrated Event, locations of the recording sessions, the facing directions of the signer, the movement direction of the event, and the sign-spatial directions of the signs



**Figure 10.6** Motorbike accident of SD - signer facing west

*SD's motorbike accident told facing north*

To test whether this signer is committed to geocentric directions – as the translations suggest – she was asked to retell the story at a different location in the village and after a 90° clockwise rotation. In the second telling, she was thus facing north. Figure 10.7 presents stills from this narration. The same participant is telling the story of SD's motorbike accident, but this recording is made at a location north-east of the location of the accident as shown in Figure 10.4. Figure 10.7 shows two stills that illustrate the main spatial constructions of the narrative: SD's collision with the dog and SD's fall to the ground. If the signer is committed to the geocentric directions of events, the direction of her signs should reflect this. Since she is facing a different cardinal direction, her signs would be oriented differently with respect to her own body but remain constant with respect to the directions of her first story, and this is indeed what we find.



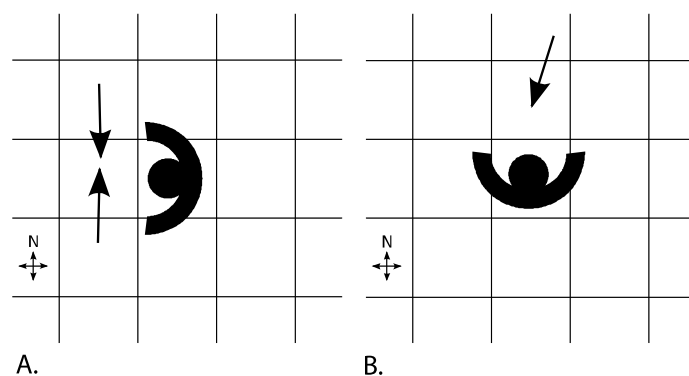
**Figure 10.7** Motorbike accident of SD - signer facing north

### *SD's collision with the dog*

Consider the left-hand stills of Figure 10.6 and Figure 10.7, in which the direction of the accident is described. In the version presented in Figure 10.6, SD is travelling in a southerly direction on his motorbike, and the dog is walking in a northerly direction. This part of the story is conveyed by the two classifier hand shapes projected on the signer's right and left. In Figure 10.7, the story is told slightly differently. The description features two entity classifiers in which the left hand represents the dog and the right hand represents the motorbike. However, in this version of the story, the dog (and the entity classifier representing it) is stationary while SD rides towards it and then hits it. Moreover, the hand representing the motorbike starts off high in the signing space and moves downward as it approaches the hand representing the dog. As will be explained in more detail in section 12.3, vertical elevation in the signing space can indicate distance and altitude in Kata Kolok, and in this case, it is believed to indicate the former, as the road on which the accident occurred is level.

In each narration, the classifier representing SD on his motorbike is formed by the signer's right hand. In Figure 10.6, the classifier sign is clearly coming from the signer's right but makes a curve as to enter the neutral signing space surrounding the signer's body from a south-easterly direction. In Figure 10.7, the classifier sign is coming from the signer's right and goes in front of her body in a south-easterly direction. The fact that the classifier hand moves towards the south-east rather than the south in the second narration, might be motivated perceptually. That is, if the signer had produced the classifier sign in a perfect southerly direction, it would have blocked the view of the classifier sign representing the dog, at least from the camera's perspective. All in all, it appears that absolute directions, rather than directions with respect to the signer's body, are kept constant. This analysis holds true regardless of the recording location and the facing direction of the signer, and is illustrated by Figure 10.8.

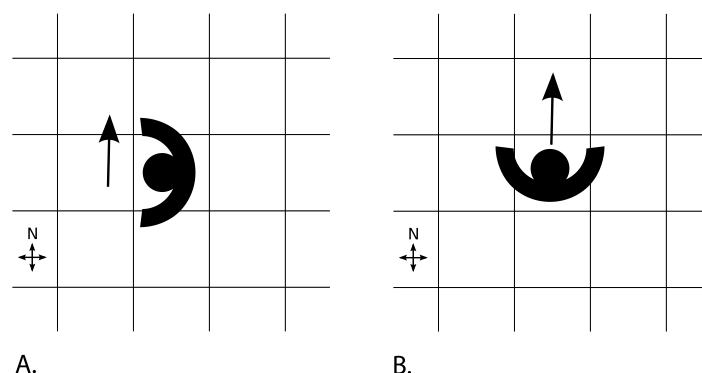




**Figure 10.8** Directions of entity classifiers representing the accident in recording 1 (panel A) and recording 2 (panel B)

#### *SD's fall*

At the end of the narrative, SD falls to the ground. Although the sign for FALL is clearly not a simultaneous classifier construction, the directionality of this lexical sign provides additional positive evidence for the absolute construction of this stretch of discourse; when comparing the final stills of Figure 10.6 and Figure 10.7 one notices that these signs for FALL are directed differently with respect to the signer's body. In the first narration, the sign is directed to the signer's right; in the second narration towards her front. These directions may not make sense unless one interprets the story in terms of absolute directions. This is illustrated by Figure 10.9.



**Figure 10.9** Directions of signs representing SD's fall in recording 1 (panel A) and recording 2 (panel B)

To summarise, the signer does not keep her signs constant with respect to her own body, but with respect to the absolute direction of the story's events. Furthermore, these absolute directions do not seem to be influenced by the location of the signer with respect to the Narrated Event, nor by the facing direction. Spatial discourse similar to the narratives analysed above have fed into an analysis as Kata Kolok spatial structures in terms of an absolute Frame of Reference (Zeshan 2006a). Kata Kolok signers deploy simultaneous classifiers constructions in absolute ways, and this is an option not previously attested in the literature on spatial descriptions in sign languages.

### 10.3.2 Relative sign-spatiality in a Kata Kolok narrative

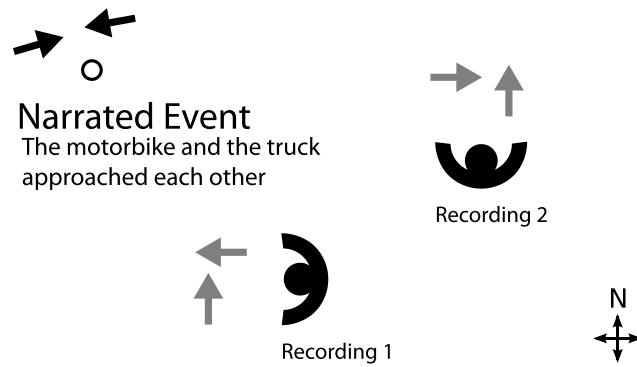
Use of the absolute Frame of Reference in simultaneous classifier constructions in Kata Kolok or in any other sign language has not been previously reported.<sup>76</sup> This finding evokes the question whether Kata Kolok signers always use the absolute Frame of Reference. In other words, does Kata Kolok exhibit any evidence of a

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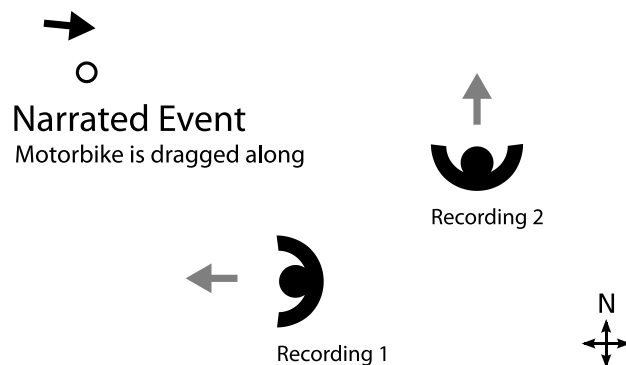
<sup>76</sup> Schuit et al. (2011) report on the existence of "absolute" locative verbs in Inuit Sign Language, however.

*relative* Frame of Reference at all? This section presents a narrative concerning a different motorbike accident in which the signer clearly adopts a relative Frame of Reference. The use of the signing space in this particular example is very similar to descriptions of the way that other sign languages inscribe the signing space from an observer perspective. I suggest that the use of the relative Frame of Reference in this case could be motivated by the lack of an eye-witness account of events.

In this narrative the signer describes how another deaf man from Bengkala (BD) collided with a truck and died. The location of the Narrated Event is north-west of the village, and approximately 10 kilometres away. The figures below present a schematic overview of the locations of the Narrated Event with respect to both recording locations, the facing directions of the signer (the black figure), a schematic representation of the two core spatial events (represented by the black arrows), and the sign-spatial directions of the signs (represented by the grey arrows). Figure 10.10 presents a hypothetical map of the motorbike and the truck approaching each other, which is based on the orientation of the road at the location where this collision occurred. As a result of the crash, the motorbike slides underneath the truck; this event and its description are schematically represented by Figure 10.11. Note that in the sign-spatial directions, the signs describing these events are inconsistent with the geocentric directions of the Narrated Event. Rather, the analysis below reveals that the signer describes the event consistently with respect to his own body.



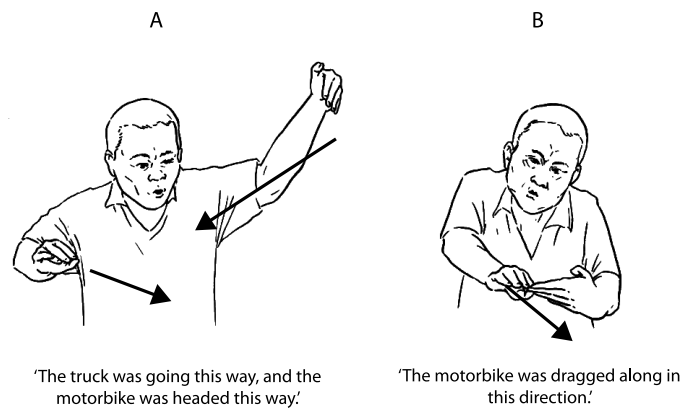
**Figure 10.10** The motorbike and the truck approaching each other  
Schematic overview of the location of the Narrated Event, locations of the recording sessions, the facing directions of the signer, the plausible movement direction of the event, and the sign-spatial directions of the signs



**Figure 10.11** The motorbike is dragged along –  
Schematic overview of the location of the Narrated Event, locations of the recording sessions, the facing directions of the signer, the plausible movement direction of the event, and the sign-spatial directions of the signs

*The motorbike and the truck approaching each other*

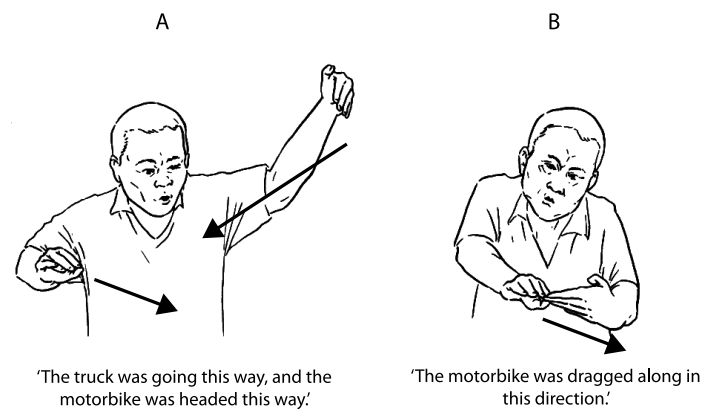
At the first recording session, the signer describes the events while facing west. He projects the motorbike on his left hand and the truck on his right hand. In this first recording, the classifier representing the truck is travelling in a straight line in a westward direction (panel A of Figure 10.12) and BD on his motorbike is going downhill in a northerly direction. The added arrows in the still represent the direction of the signs as they were produced by the signers. The elevation of the signer's left hand in the signing space indicates that BD is coming from a higher elevation than the truck. The second still shows how the man slides underneath the truck and is dragged along (panel B of Figure 10.12). Note that the sign-spatial movements of the classifier signs are inconsistent with respect to the schematic overview presented in Figure 10.10 and can therefore not be absolutely oriented.



**Figure 10.12** Motorbike accident of BD -Signer facing west

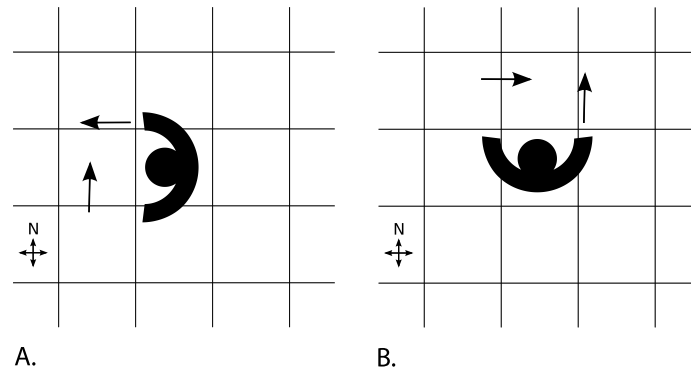
At the second recording, the signer is facing north and is asked to tell the same narrative (Figure 10.13). Again, he projects the motorbike on his left hand and the truck on his right hand. The motorbike is projected on the signer's left hand again,

but now it seems to be headed towards the east and thus rotated by 90° (panel A of Figure 10.13). Similarly, the truck seems to drive in a northerly direction in this version of the story. After the accident, the motorbike is dragged in a northerly instead of a westerly direction (panel B of Figure 10.13). Note that, again, the sign-spatial movements of the classifier signs are inconsistent with respect to the schematic overview of the first description presented in Figure 10.10. However, as will be explained below, they are consistent with a relative interpretation.

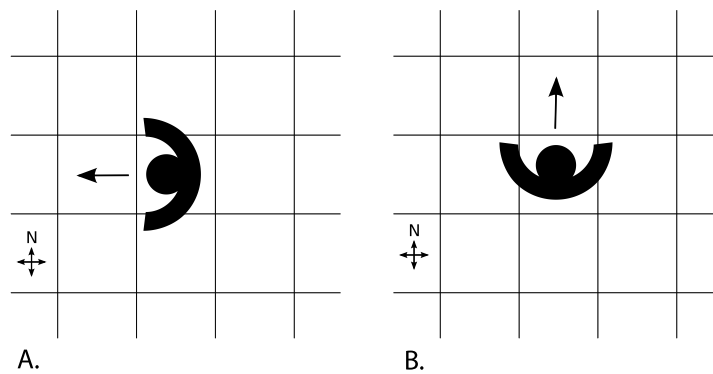


**Figure 10.13** Motorbike accident of BD - Signer facing north

The directions of the motorbike and truck approaching each other as mapped onto the hands are schematically compared in Figure 10.14. As evident in these diagrams, the signer retains the spatial direction of the signs constant with respect to his own body rather than to cardinal directions. Similarly, the motorbike dragged the signer in a westerly direction in the first version of the story, but in a northerly direction in the second narration (see Figure 10.15). These body-anchored directions are indicative of a relative Frame of Reference.



**Figure 10.14** Directions of the truck and the motorbike as they approach each other in recording 1 (panel A) and recording 2 (panel B)



**Figure 10.15** Direction in which the motorbike is dragged in recording 1 (panel A) and recording 2 (panel B)

Chapter 6 showed that the interpretation of general direction verbs in geocentric terms is in part dependent on the section of the signing space in which they are produced. In particular, it was argued that the articulatory periphery of the signing space (the extended signing space) is reserved for forms that are to be resolved

exophorically, based on geocentric locations. One might have hypothesised that this division of the signing space plays a role in describing motion events with simultaneous classifier constructions, too. However, the stills in Figure 10.12 and Figure 10.13 clearly show that, while the simultaneous classifier constructions are produced in the extended signing space, they are not interpreted in geocentric terms. As mentioned on p. 277, the directions of the signs in this latter narrative are inconsistent with fixed directions for the actual events. Furthermore, unlike the previous narrative regarding a motorbike accident, the latter collision between the truck and the motorbike was fatal, and this is a commonly known fact within the community. As a result, this incident was not witnessed by any of the villagers. Interlocutors viewing this narrative are aware of both facts, and for this reason the signer may not be held accountable for the absolute sign-spatial characteristics of these simultaneous classifier constructions.

Section 10.3.1 showed that Kata Kolok signers employ the absolute Frame of Reference to construct spatial discourse. This absolute information is passed on from one generation to the next even when the interlocutor did not personally experience the events. This suggests that Kata Kolok signers are highly attuned to picking up absolute Frame of Reference information from sign-spatial constructions. Furthermore, the example described in section 10.3.2 showed that Kata Kolok signers can construct discourse relative to their own body in ways that are very similar to reports of urban sign languages. However, this specific example seems to be related to the fact that there have been no eye-witness accounts of the event. In other words, the signer may not be held accountable for the absolute orientation of his simultaneous classifier constructions because his interlocutors are aware of the lack of reliable spatial information. The three narratives described above have provided a format to test which Frame of Reference is used, if the actual directions of the event are known. However, it has proven difficult to be certain about the direction of these kinds of events, as people's memories of them



tend to change over time, and people may disagree on what actually happened. In the absence of large quantities of data sets, it is difficult to assess what motivates or marks the use of the absolute versus the relative Frame of Reference in spatial descriptions. A way to test this would be to have signers witness staged events and then to ask them to retell these events while facing different directions. These and other remaining issues are addressed further in 10.4.

#### *10.4 Summary and discussion*

This chapter has presented an analysis of Kata Kolok narratives with respect to the sign-spatial properties of simultaneous classifier constructions by successfully implementing the rotation paradigm. The paradigm has shown for the first time how a sign language uses an absolute Frame of Reference to construct spatial discourse using simultaneous classifier constructions. From these descriptions, it has also become clear that Kata Kolok signers may choose to use an absolute spatial orientation for their signs, or not. The analyses have also raised many new questions regarding the use of Frames of Reference in Kata Kolok. At this point, for instance, it remains unclear as to what motivates the use of absolute or relative spatial constructions. Li and Gleitman (2002) suggest that the type of objects involved may determine the selection of a particular Frame of Reference, e.g. larger objects might be described in absolute terms and smaller objects in relative or intrinsic terms. However, a comparison of the motorbike accidents in the second and third narratives above reveals that Figure-Ground constructions containing the same objects can be constructed with different Frames of Reference. The analysis has also identified another important finding: given that a signer's own deictic viewpoint on events and his/her own signs may vary (as exemplified by Figure 10.3), it is not always possible to distinguish between an absolute expression from a different vantage point, and a relative Frame of Reference expression.

The analyses above have provided positive evidence for the absolute and relative Frame of Reference, but the analysis of these narratives has not led to a

clear-cut answer to the question of whether a single Frame of Reference is dominant in Kata Kolok discourse, and if so, which one. Moreover, this type of data collection does not rigidly test whether signers are committed to intrinsic Frame of Reference information in their classifier constructions. Finally, it remains unclear what information is picked up by the interlocutor. In other words, there is no definitive way to access psychological representations of simultaneous classifier constructions based on this methodology. In order to address these additional questions, new data has been collected using a structured language elicitation game called *Man and Tree*, as well as using a cognitive task called the *Animals in a Row*. Both tasks are part of the Nijmegen Space Games and are also inspired by the rotation paradigm. The results from analysis of these data sets are presented in chapter 11.

## **11 The Nijmegen Space Games**

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### *11.1 Overview*

In the previous chapter it became clear that there are limitations to the use of naturalistic language data to investigate the use of Frames of Reference in sign languages. For this reason, chapter 11 presents data that have been systematically elicited on the basis of the Nijmegen Space Games. The Nijmegen Space Games are a set of linguistic and cognitive tasks that aim to chart linguistic variation in spatial descriptions as well as cognitive diversity in spatial conventionalization across speakers of diverse languages. From these psycholinguistic tools, I selected the Man and Tree game to identify the types of angular specifications in tabletop spatial arrays, and the Animals in a Row task to capture spatial memory. The results of these tasks are presented in sections 11.2 and 11.3 respectively. Among other things, section 11.4 discusses the unexpected finding that, while Kata Kolok signers systematically favour the absolute Frame of Reference in linguistic contexts, they are more attuned to the intrinsic properties of sign-spatial constructions than to either the absolute or the relative when spatial cognition is concerned.

### *11.2 Man and Tree Game*

The Man and Tree game derives its name from the original stimulus set which shows pictures containing a miniature tree and a miniature man holding a stick. The Man and Tree game was developed by the Cognitive Anthropology Research Group (CARG) at the Max Planck Institute for Psycholinguistics in Nijmegen during the 1990s. Although its name would suggest otherwise, only six stimuli of the Man and Tree game contain a man and a tree; four stimuli contain two balls, and sixteen stimuli display two men. Section 11.2.1 provides methodological

details of the way in which the task was conducted here. Sections 11.2.3-4 present the outcomes of the Man and Tree game.

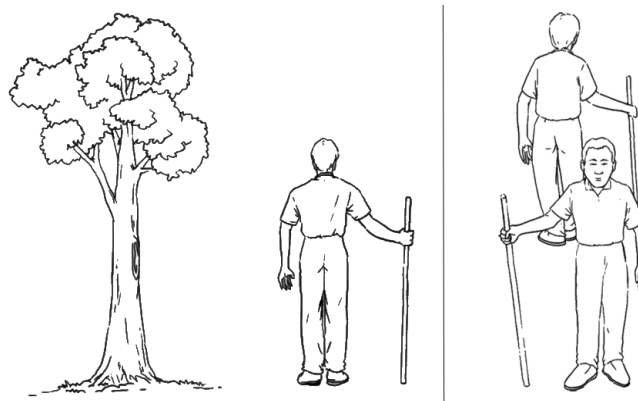
#### 11.2.1 Methodology Man and Tree game

The main aim of the Man and Tree game is for one participant (known as the director) to describe a spatial array to another participant (the matcher). The descriptions of the director are used as linguistic data, and the interpretation of those descriptions by the matcher provide insight into the semantics of these constructions. In order to address questions specific to the present study, the original Man and Tree game was altered in several respects, as discussed in the sections below.

##### *Stimuli*

Each of the stimulus photographs of the original Man and Tree game contains miniature figures arranged in such ways that elicit Figure-Ground constructions. Two examples are shown in Figure 11.1, and the complete set can be found in Appendix III. The Man and Tree game was originally developed as a so-called photo-matching task in which the director has to describe a scene in a photograph and the matcher has to identify the correct picture from a set of photographs that includes the identical image. In the current version of this linguistic task, stimulus objects rather than photographs were used, similar to previous studies of other sign languages (Arik 2008; but see Perniss 2007:83). This adaptation was necessary because, by using photographs, ambiguity emerges with respect to cardinal directions. This potential ambiguity could have introduced unnecessary and uncontrolled variables to the task. For this reason the descriptions and reconstructions by both directors and matchers were based on real objects. As a consequence, the task that was conducted here does not actually require recognition of the scene from a photograph, but rather the director needs to recall the scene from scratch, and, similarly, the matcher rebuilds the array based on the

director's description. For ease of comparison for those familiar to the original Man and Tree game, however, the respective roles of each participant are still referred to as director and matcher.



**Figure 11.1** Two examples from the Man and Tree stimulus set

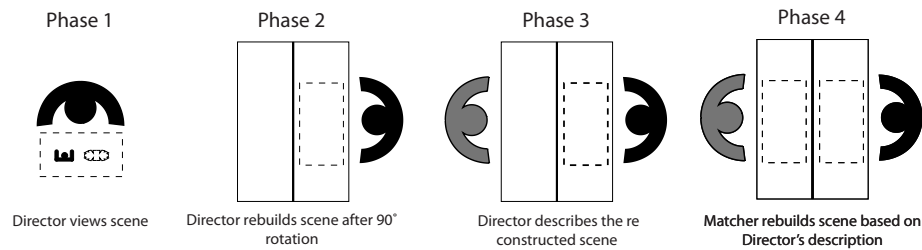
A total of 26 stimulus items were used, and each contained pictures of two objects: a man and a tree, two men, or two balls. The stimulus materials consisted of three sets of experimental items: ten items from set 2, and eight items from sets 3 and 4. The stimuli were presented in randomised blocks: participants were presented with the sets in random order, and the stimuli were randomised within each set (see Appendix III for further details). Sets 3 and 4 contain only miniature men. Set 2 contains four images with two balls and six images with a man and a tree. The stimuli objects resembled the photographs in all relevant spatial aspects. Due to restricted access to the original materials, however, similar 'men' - in the form of miniature *power rangers* - were purchased in the field at a local toy store. A tooth pick served as the man's 'stick'. Finally, instead of a red and yellow ball, I used a

red and blue ball as these were at my disposal. The experimental blocks were preceded by one practice set of four spatial arrays involving chess pieces and toy pigs. These practice trials allowed signers to become accustomed to the four phases of the experimental cycle described below.

### *Experimental phases*

The current version of the Man and Tree game is conducted in cycles of four phases, which are illustrated in Figure 11.2. For Phase 1, the director (the black figure) views a spatial array as constructed by the researcher based on the counter-balanced set of stimuli described above. After he had indicated that he had seen and remembered the spatial array, the scene was removed, and the researcher and the director talked for around half a minute to ensure that the scene was not memorised as a purely verbal encoding of the scene. Moreover, because the researcher and the director conversed in Kata Kolok, thus interfering with visual memory, this also ensured that the scene is not merely captured visually but has been retained in the long-term spatial memory of the director. Then, in this version of the Man and Tree game, the participant playing the director role walks to the experiment table, approximately 10 metres away, and sits down rotated 90° from when he first saw the scene. This rotation was added to distinguish between egocentric or geocentric coding (see section 11.2.2 for predictions and results of this experimental manipulation). During Phase 2 the researcher returns the stimulus objects to the director. Subsequently, the director reconstructs the spatial array as remembered, using the objects. Importantly, a board that was set up across the experiment table prohibited the matcher (the grey figure in Figure 11.2) from viewing the director's reconstructed scene. During Phase 3, when the director is confident he has rebuilt the scene according to his/her recollection, the director describes the scene to the matcher in order for him/her to rebuild it. The matcher has his/her own set of identical materials and uses these objects to rebuild the array

in the fourth and final phase. These four phases were repeated for the four practice items as well as each of the 26 stimulus items.

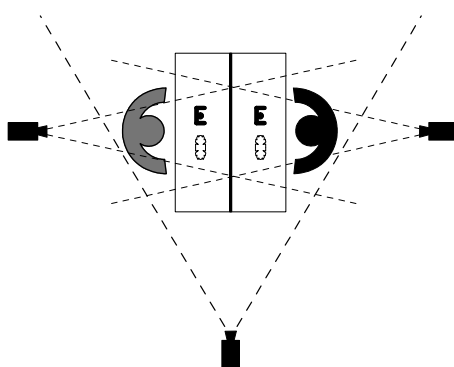


**Figure 11.2** Experimental phases in the Man and Tree game

Note that the director and the matcher are facing each other as in the experimental set-up in Perniss' (2007) study of German Sign Language. As will be explained in section 11.2.4, this experimental decision allows us to test whether Kata Kolok signers deploy mental rotation when interpreting simultaneous classifier constructions. In a few cases, the director and matcher were unsure whether they had come to the correct solution to this task. As there are several appropriate solutions in reconstructing a spatial array, the director was allowed to stand up such that he was able to view the matcher's scene. When both the director and matcher decided that they had come to a proper solution to the task, the same experimental cycle started with the next stimulus being provided by the researcher. On a few occasions, signers would ask the researcher whether the solution was correct, but she explicitly refrained from providing feedback that could bias participants towards a particular Frame of Reference or towards particular spatial information. Nevertheless, as becomes clear in section 11.2.4, director and matcher pairs arrived at similar and consistent solutions. Moreover, the fact that there was no single correct solution allowed participants to relax and enjoy the game after only a few trials.

### *Experimental set-up*

The latter three phases of the Man and Tree game were filmed from three camera angles, which are illustrated from a bird's eye viewpoint in Figure 11.3. One camera was directed at the director (black), one camera was directed at the matcher (grey), and a third camera was placed such that it recorded both signers and their reconstructed arrays from the side. The dotted lines represent the edges of the areas covered by each camera.



**Figure 11.3** Camera set-up for Man and Tree game

### *Participants*

12 deaf Kata Kolok signers were grouped into six director-matcher pairs to participate in the Man and Tree game. All of them know each other well and are regular communication partners. They were allowed to choose their own preferred partner for the game. Unfortunately, data from two of the couples turned out to be partly unusable, as for one of the recordings the tape containing the third camera angle - crucial to the analysis of the data - was damaged. Regarding the other couple, I did not find out until after the tasks were conducted that one of the

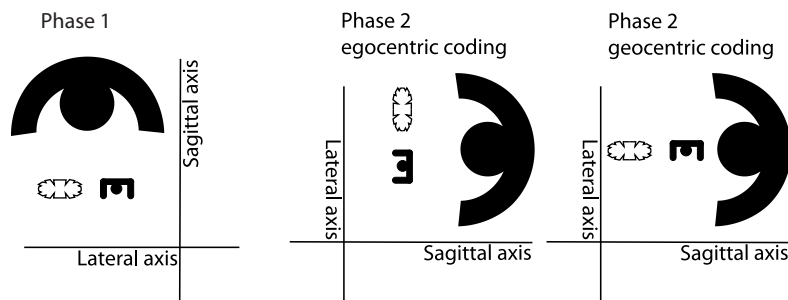


signers was not a native signer of Kata Kolok. She is a deaf woman who grew up as a home signer and did not acquire sign language until she married a deaf man from Bengkulu. The woman was a matcher within the Man and Tree game and, interestingly, her reconstructed scenes showed considerable deviation from the patterns of other matchers, and were thus left out of the general analyses. Specifically, she predominantly produced a mirror image of the director's reconstructed array. This strategy has not previously been attested in any other sign language, and is also strikingly different from the solutions converged on by native Kata Kolok signers (see Table 11.8 p. 316). Nevertheless, the initial reconstructions by the director of this couple could be, and were included.

#### 11.2.2 Director's reconstructed scene after 90° rotation (Phase 2)

The Man and Tree game was originally developed as a linguistic tool to elicit Figure-Ground constructions. In the present study, the Man and Tree game was conducted with an initial 90° rotation, which introduced an additional cognitive task to the game. This experimental manipulation aimed to identify whether signers had preserved information geocentrically or egocentrically in order to recollect spatial arrays. Participants were instructed to remember the positions and orientations of the objects in the array and to rebuild them in the 'same' way. This instruction aimed to be sufficiently general in order to ensure that it did not favour a particular solution to the task. The sections below discuss the coding, predictions, and results with respect to the three different Frames of Reference. Consider Figure 11.4 below, where the signer is presented with an initial stimulus on his/her lateral axis. After the 90° rotation in Phase 2 of the experiment, there are two possible reconstructions of the scene as illustrated in Figure 11.4. The signer either preserves an egocentric view of the scene and rebuilds the array on his/her lateral axis, or preserves a geocentric perspective. This latter option entails an axis swap with respect to the signer's body. Individuals who use a language with a dominant Relative Frame of Reference – such as Dutch - exhibit the first type of behaviour,

while speakers of language with a dominant Absolute Frame of Reference – such as Guugu Yimithirr - are known to prefer the latter strategy (Levinson 2003:130-146). This experimental set-up does not differentiate an egocentric Frame of Reference from a relative Frame of Reference expression because the signer him/herself is the individual viewing and describing the scene. Similarly, the geocentric coding option does not distinguish between an absolute Frame of Reference and Landmark-based expression. For these reasons the encoding options are labelled *egocentric* versus *geocentric*.



**Figure 11.4** Predictions for encoding axis information for Phase 2 of the Man and Tree task

All of the scenes that the directors reconstructed were coded for whether the egocentric or the geocentric axis was preserved. This resulted in 130 data points (5 directors x 26 stimuli). The data reveal that the egocentric axis (72%) was used more often than the geocentric axis (28%). These findings are rather unexpected, since Kata Kolok has previously been hypothesised to be a language that employs an absolute Frame of Reference, and so one would expect a preference for the geocentric axis in the reconstruction of spatial arrays. According to some accounts, the size of spatial arrays is critical to the selection of a specific Frame of Reference (see for example Tversky et al. 1999). Specifically, the absolute Frame of

Reference may be preferred in large-scale spatial arrays. If the observed dominance for the egocentric solutions of the directors within this task had indeed been motivated by sheer scale, one would have predicted that the matchers display a similar preference in their interpretations of the described scenes. As becomes clear in section 11.2.4, however, the matchers predominantly interpreted the descriptions in geocentric ways.

	EGOCENTRIC	GEOCENTRIC	TOTAL
No. of responses	93	37	130
%	(72)	(28)	(100)

**Table 11.1** Directors' reconstructions of array according to which Frame of Reference was preserved

Based on this data it appears that Kata Kolok signers have a preference to memorise spatial arrays in egocentric terms. Note, however, that the Man and Tree data were biased in favour of laterally presented stimuli (16 items) rather than spatial configurations on the sagittal axis (10 items). Table 11.2 presents the proportions of egocentric and geocentric responses for the lateral and sagittal stimuli. Strikingly, 91% of the lateral stimuli evoked an egocentric response on behalf of the director; the stimulus array was rebuilt on his/her lateral axis. Conversely, sagittally-presented stimuli were rebuilt in an egocentric manner in only 40% of cases. When confronted with a sagittal stimulus, directors choose to rebuild it geocentrically, on their lateral axis, in 60% of the cases. This conspicuous asymmetry suggests that the ways in which Kata Kolok signers rebuild the arrays might not be motivated by a general preference for egocentric over geocentric spatial conceptualisations, but rather it seems that there is a preference for rebuilding an array on the lateral axis, independent of the axis on which the stimulus was originally presented.

	EGOCENTRIC RECONSTRUCTION	GEOCENTRIC RECONSTRUCTION	TOTAL
LATERAL STIMULI	Lateral 73 (91%)	Sagittal 7 (9%)	80 (100%)
SAGITTAL STIMULI	Sagittal 20 (40%)	Lateral 30 (60%)	50 (100%)
TOTAL STIMULI	93 (72%)	37 (28%)	130 (100%)

**Table 11.2** Director's reconstructed scenes after 90° rotation per stimulus type

Given the experimental set-up used in this study, the asymmetry between the responses of Kata Kolok signers to the lateral and the sagittal stimuli is confounded with other spatial factors, such as the cardinal axis at which the stimuli were presented. Specifically, the lateral stimuli were presented on the *kangin/kauh* axis, and the sagittal stimuli were presented on the *kaja/kelod* axis. In the case of Tenejapans, it has been observed that the language has only a single absolute axis referring to 'downhill,' and 'uphill', and an axis 'across' that does not distinguish between 'east' and 'west'. Moreover, this linguistic encoding is also reflected by asymmetrical responses in spatial memory tasks (Levinson 2003:210). It could thus be the case that, in Kata Kolok, too, the *kaja/kelod* ('mountainward'- 'seaward') axis is more dominant than the *kangin/kauh* ('sunset'- 'sunrise') axis. To assess this hypothesis, additional experiments would be needed that systematically vary the axes at which the stimuli are presented: the signer's lateral and sagittal axes and the cardinal *kangin/kauh* and *kaja/kelod* axes. The prediction is that Kata Kolok would give more absolute responses to stimuli presented on the *kaja/kelod* axis, than when they are presented on the *kangin/kauh* axis, regardless of whether they were viewed in the signers' lateral or sagittal axis. While I have not conducted these specific tests, there is a linguistic observation that disfavours this interpretation in the case of Kata Kolok. As described in section 11.2.3, Kata Kolok signers

describe arrays by simultaneous classifier constructions on the lateral axis regardless of the axis on which they viewed the scene (whether on the *kangin/kauh*, the *kaja/kelod* axis, or the vertical axis).

The preference for lateral reconstruction described above is neither compatible with a dominant relative Frame of Reference nor a dominant absolute Frame of Reference, but *is* consistent with a dominant intrinsic Frame of Reference. That is, the directors show a strong tendency to preserve scene-internal, intrinsic information when reconstructing scenes (see Table 11.3). Specifically, for 89% of the reconstructed spatial arrays, the facing direction vis-à-vis the Ground object of the man/men as projected onto an entity classifier was consistent with the original stimulus array.

INTRINSIC FoR	PRESERVED	NOT PRESERVED	
No. of responses	116	14	130
%	(89)	(11)	(100)

**Table 11.3** The scenes reconstructed by the directors that preserved intrinsic information

It should be noted, however, that while these results are consistent with an interpretation in terms of a dominant intrinsic Frame of Reference, this task was not originally designed to differentiate between orientation-free and orientation-bound Frames of Reference. Specifically, intrinsic information is naturally entailed in both absolute and relative reconstructions. In order to fully assess the hypothesis that Kata Kolok signers focus on intrinsic cues in spatial cognition, additional tests would thus have to be conducted that target the unique semantic features of the intrinsic Frame of Reference.

### 11.2.3 Directors' descriptions of spatial arrays (Phase 3)

The sections below each describe an aspect of the directors' linguistic expressions used to describe the Figure-Ground configurations during Phase 3 of the Man and

Tree game. The interpretation of these descriptions in terms of Frames of Reference is complicated by the issue of sign-spatial significance: since all signs are essentially spatial entities themselves, their sign-spatial relationships can in principle be described in any Frame of Reference (see p. 257). The interpretations of these expressions in Phase 4 of the experiment are therefore crucial to a comprehension of their underlying spatial semantics.

#### *Identification of stimulus objects*

The stimulus objects used in the Man and Tree game were identified in different ways. The ‘man’ received an ad hoc sign name based on his physical features.<sup>77</sup> The directors chose different features to focus on and this stimulus object was referred to as HELMET, SUN-GLASSES, and HOLD-STICK. The tree is commonly referred to as TREE, but also as FLOWER and GROW. After initial identification at the beginning of a new set of stimuli, these lexical references to the stimulus objects were rarely repeated. Instead entity classifiers using either the B-hand or the IX-hand were selected. While the man was represented by either the IX-hand or the B-hand, the tree was always depicted by the B-hand.<sup>78</sup> The balls were identified by their colours, namely the lexical signs RED and GRUE followed by entity classifiers (using the S-hand or F-hand) positioned in the signing space.<sup>79</sup>

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<sup>77</sup> In addition to formal names given at birth, Deaf people give each other sign names based on e.g. facial features or habits (for more information about name signs see for instance Supalla 1992; Hedberg 1994; Locker McKee & McKee 2000; Nyst & Baker 2003).

<sup>78</sup> Kata Kolok handshapes are described in section 4.2.1.

<sup>79</sup> More information on Kata Kolok colour terms can be found in de Vos (2011) and sections 4.6.1 and 14.5.2 of this thesis.

### *Spatial constructions*

Directors used four spatial constructions to describe the spatial arrays: simultaneous classifier constructions, directional predicate constructions, sequential directional constructions, and character perspective constructions.

### **Simultaneous classifier constructions**

In the simultaneous classifier construction, each hand represents one of the objects in the spatial array by its position and orientation in the signing space. Figure 11.5 provides an example of this structure in which the left hand represents the tree and the right hand represents the man. The orientation of the palm of the hand indicates that the man is facing the tree.<sup>80</sup> Simultaneous classifier constructions were used by all directors in the Man and Tree data, and this was the most frequent structure. The construction occurred in two different temporal organisations; either the first classifier was produced and then held while the second classifier was added, or alternatively, both classifiers were produced simultaneously. In classifier constructions that describe Figure-Ground arrays in German Sign Language, the classifier denoting the Ground object canonically precedes the classifier denoting the Figure object (Perniss 2007:92). The Man and Tree data set contains six stimulus items that clearly contain a backgrounded object (the Ground) and a foregrounded object (the Figure). In Appendix III, these are stimuli 2.3-2.8. All of these arrays were rebuilt by the directors using the objects at their disposal for the purposes of the game. These reconstructed scenes were subsequently described by 22 classifier constructions, and Table 11.4 presents the varying orders that are attested in these descriptions. Notably, only two of the directors are responsible for the attested variation; one signer only used a single simultaneous classifier

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<sup>80</sup> Note that, unlike many other sign languages, Kata Kolok does not use a two-legged entity classifier to represent individuals, but rather indicates them by an upright form of the B or IX-hand.

construction in describing these stimuli, and another signer only used the Ground-Figure order. The individual variation in the descriptions of the Man and Tree stimuli is discussed in more detail on p. 308.

	GROUND (TREE) - FIGURE (MAN)	FIGURE (MAN) - GROUND (TREE)	SIMULTANEOUS PRODUCTION OF BOTH CLASSIFIERS	TOTAL
No. of occurrences	12	7	3	22
%	(55)	(32)	(14)	(100)

**Table 11.4** Order of the classifiers in the Figure-Ground descriptions  
(figures in brackets are percentages of the total number of classifier constructions in  
the Man & Tree data set)

Perniss (2007:95) also reports that, in German Sign Language data, signers only produce classifiers simultaneously when describing two identical objects, but this restriction does not hold for Kata Kolok, where different classifiers representing different objects were observed to be produced simultaneously (see Table 11.4). Furthermore, in Kata Kolok, both simultaneous classifier constructions can occur without explicit nominal reference to the individual objects and this option is not attested in German Sign Language (cf. Perniss 2007). Further, the classifiers were never used sequentially, that is to say with one classifier being produced, and disappearing from the signing space before the other classifier was placed in the signing space in Kata Kolok. More information on the frequencies of the various constructions is provided on p. 307.



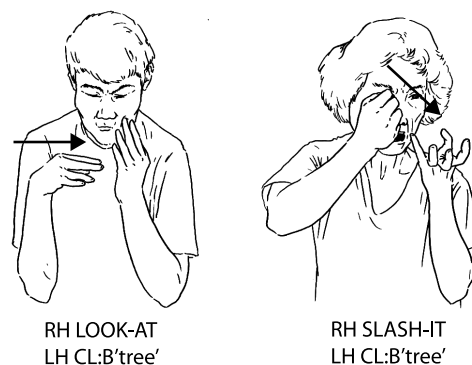


**Figure 11.5** Simultaneous classifier construction

### **Directional predicate construction**

In addition to simultaneous classifier constructions, the verbal predicate LOOK-AT can also be directed meaningfully when produced simultaneously with an entity classifier, or towards another form of LOOK-AT. This sign provides scene-internal orientation information and is illustrated by the left-hand still in Figure 11.6. In the right-hand still of Figure 11.6 the sign SLASH-IT is produced together with the entity classifier. This sign is best analysed as a handle classifier that is used to represent the man holding his stick to slash the tree. This latter form was only used to describe the stimuli featuring a man and a tree, and was not used to describe two men. Notably, LOOK-AT only occurred in the Man and Tree data set, and does not occur in the spontaneous corpus of Kata Kolok. Moreover, when describing the act of ‘looking,’ ‘watching,’ and ‘seeing,’ signers either use the lexical sign EYE (which constitutes an index finger point to the signer’s eye; see section 14.5.1), or enact the looking by adopting character perspective. For these reasons, LOOK-AT

does not appear to be a regular transitive verb in Kata Kolok, and additional data and analyses would be required to determine the linguistic structures in which it is used.



**Figure 11.6** Directional predicate construction

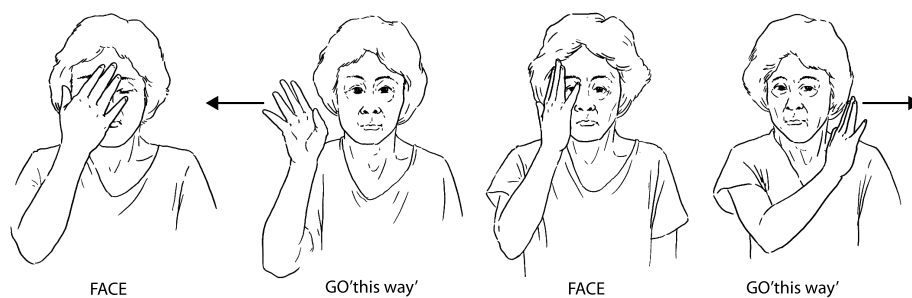
### **Sequential directional construction**

The second most frequent construction of the data set is the sequential directional construction. In this type of spatial description the facing direction of the man is indicated by the sign FACE followed by the verb GO-FROM-HERE-TO-B iconically directed in space.<sup>81</sup> Orientation information is thus given in a sequential manner. An example of the sequential directional construction is provided in Figure 11.7. The construction does not disambiguate the facing direction of the men with respect to each other; the statement below would be appropriate for any situation in which the signers are facing in opposite directions, whether they are facing each other, back-to-back, or side-by-side. The description in Figure 11.7

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<sup>81</sup> Section 6.5.1 described the formal and functional characteristics of GO-FROM-HERE-TO-B in more detail.

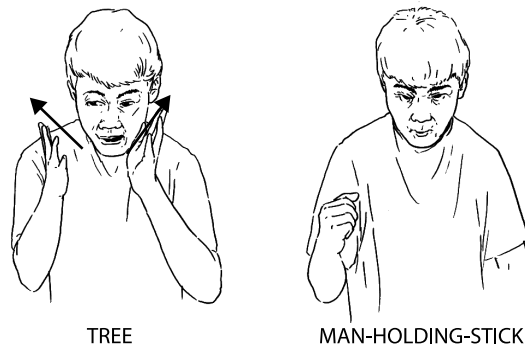
does not disambiguate between stimuli 4.9 and 4.10, for example. Presumably because of this ambiguity, the sequential directional construction is combined with a simultaneous classifier construction indicating the respective positions of the men in each case.



**Figure 11.7** Sequential directional construction

### **Character perspective construction**

The man (but never any of the inanimate stimulus objects) is projected onto the director's body by means of character perspective in both character perspective constructions and mixed perspective constructions. In the present data set, directors would use the perspective of the man to provide scene internal information. Figure 11.8 illustrates this construction. The signer starts enacting the man while he produces the lexical sign TREE, followed by an enactment of the man holding the stick, facing the projected tree.



**Figure 11.8** Character perspective construction

### **Mixed perspective construction**

On rare occasions, and only in response to the stimuli with a man and a tree, a blend of a simultaneous classifier construction and the above described character perspective construction occurred. An example of this mixed perspective construction is presented in Still 11.1 below. The still was taken from the description presented in the first line of Example 11.1. In this description, the signer enacts the man by using role shift. He first produces the lexical sign GROW and then places an entity classifier in the signing space to refer to the tree. He holds this entity classifier (as indicated by the dotted line in the gloss) while using the sign HOLD-STICK to refer to the miniature man. Then he uses the predicate LOOK-AT directed at his addressee. This mixed perspective construction differs from the character perspective construction in that it uses an entity classifier to represent the tree, rather than the lexical sign GROW, which has an upward movement and is produced bimanually (see the left-hand still of Figure 11.8). In Perniss' (2007:226) work on German Sign Language, this type of blend between an entity classifier and character perspective taking is called a non-aligned character perspective construction.

Subsequently, in the second line of Example 11.1, the signer describes the same scene by repeating the entity classifier representing the tree and simultaneously producing the predicate LOOK-AT directed at the entity classifier that designates the tree. He holds the entity classifier representing the tree and then produces an entity classifier with his right hand to indicate the man. The entity classifier is oriented towards the tree as indicated by the fact that the palm of the hand faces the classifier that represents the tree. The first construction in the second line of Example 11.1, indicated by bold type, was coded as a directional predicate construction. The final construction, indicated by italic type, was coded as a simultaneous classifier construction.



RH HOLDING-STICK  
LH CL:B'Tree'

**Still 11.1** Mixed perspective construction

Example 11.1 Mixed perspective construction

NM	'pah'			'role shift'
MG	GROW		HOLD-STICK	LOOK-AT
ND		Entity-CL:B'tree'		

'There is an upright entity (the tree) on this side and a man holding a stick looking at it.'

↓ Still 11.1

NM			
MG	LOOK-AT'tree'	Entity-CL:B'man facing tree'	
ND	Entity-CL:B'tree'	Entity-CL:B'tree'	

'The guy is looking at the tree; he is oriented towards the tree.'

MTJS4mar8\_mixed\_perspective\_construction.mpg

Example 11.1 above makes it clear that character perspective constructions and the mixed perspective construction show considerable formal overlap, and at this point it is unclear whether the mixed perspective construction constitutes a separate structure, or should be considered a simultaneous blend of a character perspective construction and a simultaneous classifier construction.

*Frequencies of spatial constructions*

Recall that there were 26 stimuli and 5 directors describing the scenes in the Man and Tree game (section 11.2.1). Table 11.5 provides the overall frequencies of the structures used to describe these scenes. Similar to Example 11.1, all descriptions involved at least one simultaneous classifier construction, and multiple types of construction were often combined to describe a single scene. The overall frequency of the simultaneous classifier construction is 56% of the descriptions. Sequential

directional constructions, the second most frequent structure, represent 22% of the data set.

SPATIAL STRUCTURES	NO. OF OCCURRENCES	%
Simultaneous classifier construction	176	(57.0)
Sequential directional construction	66	(21.4)
Character perspective construction	35	(11.3)
Directional predicate construction	27	(8.7)
Mixed perspective construction	5	(1.6)
TOTAL	309	(100)

**Table 11.5** Frequencies of spatial structures  
(figures in brackets are percentages of the total number of spatial structures in the Man & Tree data set)

Table 11.6 displays the frequencies of spatial structures per stimulus type. Sets 3 and 4 contain humanoid stimulus objects exclusively and they feature more cases of multiple strategies used together in a single description of spatial structures. One reason for this pattern could be the fact that the humanoid stimulus objects are inherently featured, while Kata Kolok signers did not attribute facets to the balls and the trees. In effect, there was thus more spatial information which needed to be encoded in the stimulus items which contained two men. Stimulus Set 2 contains six arrays with a man and a tree as well as four configurations of balls.

Table 11.6 shows that mixed perspective constructions were used exclusively to describe stimulus items containing a man and a tree. Furthermore, the character perspective construction was not used in the arrays with two balls, and was less frequent for the Man and Tree stimuli than for the arrays with two men. Presumably this can be explained by the fact that balls are less likely to be objects

of personification than humanoid objects.<sup>82</sup> Individual differences between signers are described below.

STIMULUS TYPE	TWO MEN	MAN AND TREE	TWO BALLS
Simultaneous classifier construction	110 (51.6%)	44 (65.6%)	22 (75.9%)
Sequential directional construction	48 (22.5%)	11 (16.4%)	7 (24.1%)
Character perspective construction	31 (14.6%)	4 (6.0%)	-
Directional predicate construction	24 (11.2%)	3 (4.5%)	-
Mixed perspective construction	-	5 (7.5%)	-
TOTAL	213 (100%)	67 (100%)	29 (100%)

**Table 11.6** Frequencies of spatial structures per stimulus type  
(percentages in brackets give relative frequencies of spatial structures for each stimulus type)

#### *Individual Preferences*

During the course of the Man and Tree game each director and matcher couple developed preferences for certain structures. The absolute and proportional frequencies of the structures for each of the directors are presented in Table 11.7. It is clear that Directors 3 and 4 used very different strategies compared with the other directors. Director 3 used more directional predicate constructions and character perspective constructions. While most directors chose to use simultaneous classifier constructions to convey information about facing direction, director 3 preferred to use character perspective constructions and directional

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<sup>82</sup> Note, however, that inanimate objects can on occasion be personified in some sign languages.



predicate constructions to do this, and he did so mostly in response to the stimuli with two men. In particular, he often started off by using character perspective to indicate the facing direction of the men in the scene, followed by the directional predicate LOOK-AT on both hands positioned in the signing space to indicate the position and orientation of the men with respect to each other and to their location in space. Other directors used simultaneous classifier constructions to convey this. This suggests that, functionally, simultaneous classifier constructions and directional predicate constructions are akin to each other (see also Perniss 2007:156f).

STIMULUS TYPE	D1	D2	D3	D4	D5
Simultaneous classifier construction	44 (68.8%)	54 (70.1%)	21 (31.8%)	22 (50.0%)	35 (60.3%)
Sequential directional construction	12 (18.8%)	18 (23.4%)	4 (6.1%)	20 (45.5%)	12 (20.7%)
Character perspective construction	4 (6.3%)	2 (2.6%)	22 (33.3%)	-	7 (12.1%)
Directional predicate construction	3 (4.7%)	3 (3.9%)	17 (25.8%)	2 (4.5%)	2 (3.4%)
Mixed perspective construction	1 (1.6%)	-	2 (3.0%)	-	2 (3.4%)
TOTAL	64 (100%)	77 (100%)	66 (100%)	44 (100%)	58 (100%)

**Table 11.7** Frequencies of constructions per director (D1-D5)  
(percentages in brackets give relative frequencies of spatial structures for each director)

Another observation that can be made, based on Table 11.7, is that director 4 uses more sequential direction constructions than the other directors. One possible reason for this is that the director-matcher couple developed a strategy in which the matcher would start off with producing a simultaneous classifier construction that

represented a hypothesised array. The relatively high frequency of sequential directional constructions is thus not being caused by an absolutely larger number of sequential directional constructions, but rather by the absence of simultaneous classifier constructions in the director's descriptions. This analysis is also supported by the fact that the absolute frequency of simultaneous classifier constructions by director 4 (22 occurrences) is considerably lower compared to D1, D2, and D5 (44, 52, and 35 respectively) (see Table 11.7). These frequencies indicate that signers might have individual preferences for the types of structures they use to describe spatial scenes.<sup>83</sup>

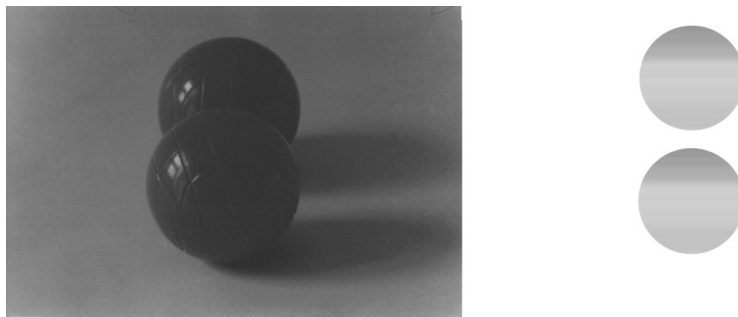
#### *Sign-spatial neutrality of the lateral axis*

In section 9.5, it was explained that one way to determine the exact sign-spatial properties that the language encodes is to observe the signer's description of the reconstructed scene, and the final interpretation of the scene as reconstructed by the matcher. This section describes one general observation that needs to be made at this stage of analysis concerning the kinds of spatial descriptions that Kata Kolok signers provide: signers do not always describe spatial arrays using the same axis on which they saw them. This is illustrated by two descriptions of spherical stimuli that were viewed on the sagittal and vertical axis respectively, but described on the lateral axis. The left-hand image in Figure 11.9 displays two sagittally aligned balls which were presented as real objects on the signer's sagittal axis within the current set-up of the Man and Tree game. The right-hand image of

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<sup>83</sup> It would be interesting to compare this variation in sign-spatial structures to inter-signer variation in responses by users of other sign languages, and similar data is indeed available from German Sign Language (Perniss 2007), Turkish Sign Language (Arik 2008), and the different cohorts of Nicaraguan Sign Language (Pyers et al. 2010). One potential outcome might be that variation among Kata Kolok signers is larger than among German and Turkish Sign Language users, but less than among Nicaraguan Sign Language users due to inter-generational processes of conventionalisation.

Figure 11.9 shows two vertically aligned spheres on paper, and this stimulus image was used in a task eliciting shape descriptions for the Language of Perception project (Majid & Levinson 2007). Given the iconic potential of simultaneous classifier constructions, one might expect that these stimuli would result in descriptions on the sagittal and vertical axis respectively. In spite of this, both stimuli received descriptions using simultaneous classifier constructions on the lateral axis, as is shown in Figure 11.10. The still of a simultaneous classifier construction on the left was produced in response to the description of the physical balls in Figure 11.9, and the still on the right was produced in response to the vertically-placed spheres on the right.



**Figure 11.9** Spherical stimuli that received lateral descriptions



**Figure 11.10** Lateral simultaneous classifier constructions in response to non-lateral stimuli

The above examples provide evidence against the conclusion that iconicity exerts a strong influence on the sign-spatial properties of simultaneous classifier constructions in Kata Kolok. That is to say, strictly speaking, these simultaneous classifier constructions are not direct isomorphic representations of the spatial arrays. This is surprising because previous research on American Sign Language has shown a preference for isomorphic and gradient representations of simultaneous classifier constructions (Emmorey & Herzig 2003). However, Perniss (2007:245) has shown that in German Sign Language, entity classifiers may be used in marked and unmarked forms, such that despite its inherent features the orientation may or may not be considered relevant to the utterance.

To what extent do signers exploit the sign-spatial neutrality of the lateral axis when producing simultaneous classifier constructions and directional predicate constructions? Table 11.2 showed that the directors reconstructed the spatial arrays on the lateral axis in 103 out of 130 of the items, irrespective of whether the original stimulus was present on the lateral or sagittal axis. These laterally reconstructed scenes were all described by simultaneous classifier constructions and/or directional predicate constructions that were produced on the signer's lateral

axis.<sup>84</sup> This result is expected because the sign-spatial characteristics of these constructions are isomorphic with the actual orientation of the rebuilt scene. Surprisingly, 11 out of the 27 sagittally reconstructed scenes were described by simultaneous classifier constructions on the signer's lateral axis, too. The fact that Kata Kolok signers may represent spatial information on the lateral axis that was perceived on the sagittal or vertical axis suggests that the lateral axis may function as an unmarked form. In other words, when a simultaneous classifier construction is produced on the lateral axis, signers may not be committed to that axis being relevant to the utterance in Kata Kolok. This interpretation is supported by the fact that these structures were all preceded or followed by an additional directional predicate construction, simultaneous classifier construction, or sequential directional construction providing orientation information. These additions were provided fluently, and without any indication of misunderstanding from the interlocutor, which suggests that this addition was expected at least within the context of this task. Interestingly, Arik (2008) describes a similar phenomenon for Turkish Sign Language users, who may describe spatial arrays that they viewed on a lateral axis (two cars behind one another), on the sagittal axis. It remains unclear, however, as to whether these forms, too, were supplemented with additional sign-spatial structures to indicate the orientation of the scene as a whole.

The fact that Kata Kolok, German Sign Language, and Turkish Sign Language users produce classifier constructions that abstract away from true isomorphism is a crucial point, as it pertains to the issue of sign-spatial significance put forward in section 9.5. Kata Kolok signers are clearly doing more than presenting an isomorphic image of the scene, which is necessarily based on egocentric coordinates. Rather, their description entails a conceptualisation of the array, and

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84 A lateral stimulus can nevertheless be represented on the sagittal axis by using a dedicated construction providing a scene-internal perspective; this so-called character perspective construction is addressed on p. 301.

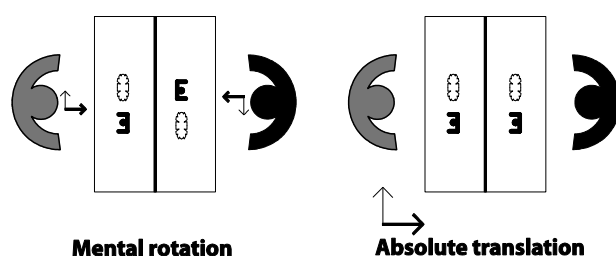
they choose to suppress certain aspects of the spatial information provided by the image. In other words, the spatial relationship between both objects is identified and categorised as a type of relationship, which allows them to describe the configuration in (at least partly) non-iconic ways. Moreover, the comparison between Kata Kolok and Turkish Sign Language – in which the lateral and sagittal axes are neutral with respect to viewpoint, respectively – reveals that sign languages differ in the ways in which these abstractions are conventionalised.

Section 9.5 already highlighted that sign-spatial relationships can in principle be described in any Frame of Reference, since signs are essentially spatial entities themselves. An additional methodological implication of sign-spatiality arises in light of the observed sign-spatial neutrality of the lateral axis. Without knowledge of the pragmatic context in which such expressions have occurred, one cannot assume that these sign-spatial constructions entail orientation information in terms of a relative or absolute Frame of Reference. Such an analysis would therefore be inadequate to capture the spatial meanings that these sign-spatial expressions convey within their signed context (see also chapter 5). In order to come to a deeper understanding of the underlying semantics of spatial structures, section 11.2.4 addresses their spatial interpretations by the matchers.

#### 11.2.4 Reconstruction by the matcher (Phase 4)

During Phase 4 of the Man and Tree game, the matcher reconstructs the scene based on the director's instructions. There are four logical ways in which this spatial reconstruction may take place: a mental rotation, an absolute translation, a mirror image, and a spatial blend. The first two options are illustrated in Figure 11.11. In the case of mental rotation, the scene is rotated as a whole and reconstructed from the director's perspective. In the sign languages for which the Man and Tree data have been collected, this is the preferred strategy (see for example Emmorey, Klima, & Hickok 1998; Perniss 2007:155; Arik 2008; Pyers et al. 2010). In the case of an absolute translation, the scene is relocated without

rotating the scene. For the Kata Kolok data, absolute translation was predicted to be the dominant pattern, as this conforms to the geographic locations and orientations of the objects involved (see section 9.3.3 on why this is predicted).

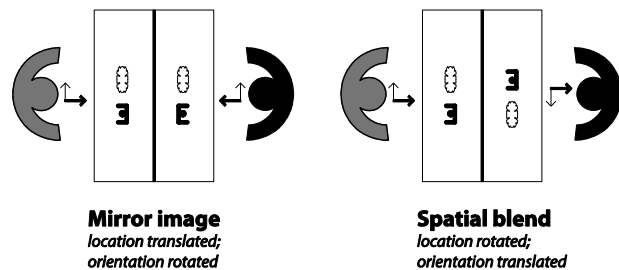


**Figure 11.11** Mental rotation versus absolute translation

In addition to the two main strategies there are two additional patterns that might occur: a mirror image, or a spatial blend. These are considered separately, as they constitute mixed spatial reconstructions: orientation and location information is reconstructed by the matcher in an inconsistent way. In the case of a mirror image, the location information of the array is translated while the orientation information is rotated. This effectively produces a mirror image. Conversely, in the case of a spatial blend, the location information is rotated, while the orientation information of the array remains constant. These patterns are illustrated in Figure 11.12 below. Both patterns are inherently inconsistent with respect to any one of the Frames of Reference and are therefore not predicted to occur as a dominant pattern. The predicted infrequency of these mixed spatial constructions is borne out by the data, as shown in Table 11.8 on p. 316.<sup>85</sup>

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<sup>85</sup> Interestingly, a Kata Kolok signer who grew up as a home signer and participated in this study as a matcher, predominantly produced mirror images, and her data were excluded from the overall analysis (see also p. 291).



**Figure 11.12** Mixed spatial reconstructions

Not all stimulus items from the Man and Tree game were equally suited to determine the preference for either of these four types of spatial reconstruction. Specifically, all items from Stimulus Set 4 and items 2.9 and 2.10 are inherently symmetrical and absolute translation or mental rotation therefore renders identical reconstructions. Furthermore, in Phase 2 of the Man and Tree game, the five directors reconstructed these 16 items symmetrically after 90 degree rotation in 25 instances.

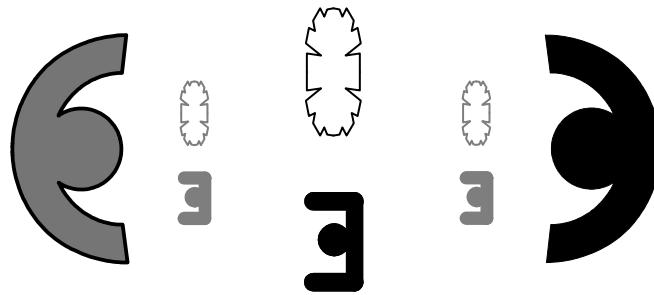
Table 11.8 presents the percentages for the kind of spatial reconstruction of the director's reconstructed scene by the matchers for the remaining 55 stimulus items. 78% of reconstructions by the matchers followed an absolute translation of the director's scene. In 18% of cases mental rotation was chosen as a strategy. In 4% of cases either a mirror image or a spatial blend was produced. Both the absolute translation and the mental rotation solution to this task preserve the scene-internal orientation information. Therefore the intrinsic Frame of Reference is adhered to in 96% of cases. A preference for absolute translation over mental rotation has never been reported for any sign language. For example, a detailed analysis of the Man and Tree game undertaken by signers of German Sign Language (Perniss 2007:155) shows the opposite tendency. That is, in 73% of cases, matchers using German Sign Language performed a mental rotation. These statistics are also shown in Table 11.8.



	KATA KOLOK	GERMAN SIGN LANGUAGE (PERNISS 2007:155)
Absolute Translation	43 (78%)	9 (14%)
Mental Rotation	10 (18%)	47 (73%)
Mirror images/ Spatial Blends	2 (4%)	8 (13%)
Total	55 (100%)	64 (100%)

**Table 11.8** Reconstructed scenes by matchers  
(percentages in brackets give relative frequencies of the response types for each sign language)

It is interesting to note that while signers of other sign languages prefer to use mental rotation, they sometimes adopt a strategy very similar to the absolute translations described above. That is, in everyday conversation about spatial arrays, signers often share a physical environment and discuss these objects each from their own vantage points without having to compute a mental rotation, and this notion of shared space was introduced by Emmorey, Tversky, and Taylor (2002). Figure 11.13 illustrates the notion of shared space. Note however, that the Kata Kolok signers in this experiment did not have a joint view of the objects due to a screen across the table (see section 11.2.1), and their particular use of the signing space is therefore not motivated by a joint view of the objects involved.



**Figure 11.13** Shared space  
(as described by Emmorey, Tversky, & Taylor 2002)

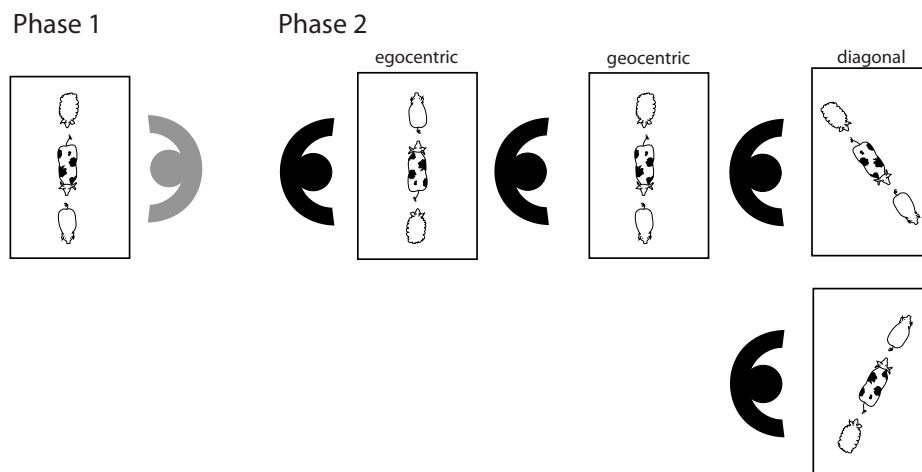
The overall results from the Man and Tree Game indicate that the directors are prepared to omit absolute and relative Frame of Reference information in favour of a lateral reconstruction of the scene in Phase 2, but that their sign-spatial descriptions canonically foreground the absolute Frame of Reference. Specifically, descriptions of these tabletop arrays are interpreted geocentrically in the majority of cases, and additionally, the matchers are highly attuned to intrinsic information in these sign-spatial constructions. The differences in the results between Phase 2 and Phase 4 of the Man and Tree game indicate that Kata Kolok signers adopt two different strategies depending on the nature of the task. In linguistic description and interpretation, intrinsic and absolute Frame of Reference information is highlighted, but in the cognitive task of memorizing the spatial arrays the participants focused primarily on the intrinsic Frame of Reference. This latter pattern is corroborated by results from the Animals in a Row task, which are detailed in section 11.3. Section 11.4 compares the findings of each of the games.

### *11.3 Animals in a Row task*

The Animals in a Row task, just like the Man and Tree game, is one of the Nijmegen Space Games (Senft 2007). In contrast to the Man and Tree game, the

Animals in a Row task is not a linguistic elicitation task but aims to chart spatial cognition through memorising spatial arrays. In this task the viewer of the scene is presented with a small-scaled spatial array made up of three miniature animals. These three animals are taken from a set of four: a pig, a cow, a horse, and a sheep. The three animals are put in pseudo-random order along the lateral axis of the participant who is to view and memorise the array. After the participant has viewed the scene, it is removed and the researcher talks to the participant for around half a minute to ensure that the participant does not retain a purely verbal encoding of the scene. In this case, the researcher and the director conversed in Kata Kolok, and this also ensured that the scene could not be retained in short-term visual memory. Then, the participant is rotated by 180° and asked to rebuild the scene as memorised. In the Animals in a Row task as it was conducted here, signers viewed the scene outside a room on a rectangular table and rebuilt the array on a similar rectangular table inside the room. The tables were approximately four metres apart.

There are different solutions as to how to rebuild this scene, depending on whether one is using egocentric or geocentric coding. If the participant encodes the spatial array from an egocentric perspective, the scene is reconstructed with the animals following the same left-to-right order. If a participant is using geocentric coding, the scene will be reconstructed in a way that sustains the absolute direction of the scene. Additionally, a third solution to the Animals in a Row task was attested in the responses of Kata Kolok signers: a diagonal reconstruction of the scene. The experimental set-up and the possible outcomes are presented in Figure 11.14. The sections below discuss the relevance of the diagonal solutions in particular.



**Figure 11.14** Animals in a Row task

12 adult, native deaf signers of Kata Kolok participated in the Animals in a Row task. Each participant was presented with the same two practice trials, but each received five different experimental trials that were created randomly. All scenes contained three animals and in each of the scenes the animals were consistently head to tail (facing either to the left or to the right).

In parallel to the findings of the director's reconstruction in Phase 2 of the Man and Tree game (see Table 11.2), the direction of the scenes in the Animals in a Row task show considerable variation. In 33% of cases the participants preserve a egocentric direction; in another 30% of the cases the participants preserve a geocentric direction. In 37% of reconstructed scenes the participants recreated the scene diagonally. These diagonal reconstructions were documented by the researcher in sketch form. For this reason the angle of the axis along which they were produced in relation to the squared table edge is not known exactly, but they are estimated to deviate by 30-45 degrees. In any case, their occurrence is striking because they are incompatible with any strong influence from the spatial array as it

was viewed by the signer, and this suggests that signers are not attuned to any of the orientation-bound Frames. The chart in Table 11.9 provides the frequencies of the three patterns.

TYPE OF RESPONSE	NO. OF RESPONSES	%
Egocentric	20	(33)
Geocentric	18	(30)
Diagonal	22	(37)
Total	60	(100)

**Table 11.9** Directions preserved in Animals in a Row task

The diagonal responses are particularly intriguing, because they were not anticipated, and turned out to be at least as frequent as the other response types. How can we make sense of these responses? First of all, as happens in remote field sites, the experimental setting was not perfectly controlled in a way that would have been possible in a lab. In this case participants were not just turned 180° but were also translocated four metres. Given this particular setting it could be that they were using a local landmark from which to project spatial scenes. This kind of anchoring in relation to a Landmark may explain why the scenes were slightly skewed. For instance, it could be the case that the window of the room in which the experiment took place was used as a landmark, but thus far there has been no positive evidence for this hypothesis. Moreover, although this kind of explanation suits most of the responses, it does not explain the whole pattern, which exhibits a lot of variation more or less equally distributed over three options: egocentric, geocentric, and diagonal reconstructions. Table 11.10 demonstrates this by showing the responses per participant.

PARTICIPANT	EGOCENTRIC	GEOCENTRIC	DIAGONAL
1	3	2	0
2	2	1	1
3	2	1	1

4	2	2	1
5	2	2	1
6	0	4	1
7	3	0	2
8	2	1	2
9	1	1	3
10	1	1	3
11	0	2	3
12	0	1	4
Total	20	18	22

**Table 11.10** Responses to the Animals in a Row task per participant

Given this variation it could also be the case that, in memorizing spatial scenes, participants were not attuned to the orientation of the whole scene at all. In essence, their reconstructions of the scene might be viewpoint free, just as intrinsic Frame of Reference and Landmark-based expressions are, and for this reason the participants would be allowed to reconstruct the spatial scene at various angles (see section 9.3.3). The data are consistent with the idea that when Kata Kolok signers construct spatial scenes, they do not use any form of scene-external perspective; this means that neither the relative nor the absolute Frame of Reference is relied upon consistently, but rather, intrinsic information is used where possible.

While their reconstructions were inconsistent with respect to the orientation of the scene as a whole, matchers preserved the facing information within the scene in all but one trial (98% of trials). This finding is compatible with the outcome of the Man and Tree game. That is, in the directors' reconstructions, after a 90° rotation, intrinsic information was preserved in 89% of the cases. Moreover, in their descriptions of the scene matchers were attentive to the orientation features of the people within the spatial arrays. It should be noted however that, although the Animals in a Row task captures internal orientations perfectly, it was not developed to test whether individuals were systematically attuned to the intrinsic Frame of Reference. Across the stimuli, the facing direction of the animals was kept constant; all animals were presented head to tail. In order to test whether

intrinsic Frame of Reference information is crucial to the spatial cognition of Kata Kolok signers the same experiment could be conducted while systematically varying the facing directions of the animals.

#### *11.4 Summary and discussion*

The Geocentric Hypothesis (section 9.4) suggested that Kata Kolok exhibits a geocentric spatial reference system. The analysis in chapter 10 shows that Kata Kolok signers indeed effortlessly deploy an Absolute Frame of Reference in constructing narratives. The linguistic data that were elicited by the Man and Tree game and analysed in chapter 11 also support the Geocentric Hypothesis in the sense that Kata Kolok signers prefer absolute translation rather than mental rotation in the interpretation of simultaneous classifier constructions.

One surprising outcome has been that the simultaneous classifier constructions that described sagittally reconstructed spatial scenes were sometimes described by simultaneous classifier constructions on the lateral axis, while the reverse pattern – lateral scenes described by sagittally- produced simultaneous classifier constructions – was not attested. These observations indicate that the lateral axis may serve as an unmarked form within certain contexts. Chapter 10 also revealed that Kata Kolok signers need not commit to the geocentric relevance of their sign-spatial utterances, and as with previously described sign languages, Kata Kolok signers may also adopt a relative Frame of Reference. It was suggested that this latter type of spatial construction might be especially favoured in cases where both the signer and his/her interlocutors are unaware of the absolute orientation of the Narrated Event. These findings from chapters 10 and 11 support the idea that while Kata Kolok signs canonically adopt the absolute Frame of Reference in both production and perception, that the meaning these sign-spatial structures convey is in part determined by their pragmatic implementation. As was argued in chapter 5,

this observation disfavours a morphological analysis of the specific sign-spatial structures that have been deployed to provide spatial descriptions.

Chapter 9 explained that, due to the nature of the gestural modality, two Frames of Reference can be expressed simultaneously without contradicting each other. The linguistic data presented in chapters 10 and 11 did not allow us to rigidly test whether Kata Kolok signers included the intrinsic cues in their sign-spatial descriptions, but 96% of reconstructed arrays by the matcher of the Man and Tree game preserved intrinsic information (see section 11.2.4). This observation is consistent with the interpretation that Kata Kolok signers deploy the intrinsic Frame of Reference in addition to the absolute Frame of Reference. The intrinsic Frame of Reference is in fact ‘close to linguistic bedrock’ (Levinson 2003:81-83). That is, as far as we know, all languages in the world have an intrinsic Frame of Reference (although some rarely make use of it), and some languages even rely exclusively on it.

At the very least, the present data do not support an interpretation in which the relative Frame of Reference is dominant in Kata Kolok. As such, Kata Kolok is the first sign language in which a dominant relative Frame of Reference is not positively attested. A signer’s viewpoint of his/her own signs seems such a natural iconic marker that its relevance has often been taken for granted. However, the overall results in this part of the thesis suggest that Kata Kolok signers suppress the relevance of their own viewpoint when expressing spatial information. The assumption concerning the omnipresence of the relative Frame of Reference is not unique to sign linguists. Its dominance has often been presumed by psychologists on perceptual grounds, but as Levinson (2003:43) mentions, “Although from a perceptual point of view a Frame of Reference like the relative one seems entirely fundamental, from a linguistic point of view it is not.” Some languages do not have a relative Frame of Reference, while a language without an intrinsic Frame of Reference has yet to be identified. The markedness of the relative Frame of



Reference is also paralleled in developmental data showing that children acquire this Frame later on, while the intrinsic Frame of Reference is acquired before the other Frames (Johnston & Slobin 1979). In light of this, it is particularly intriguing that Nicaraguan Sign Language did not have a conventionalised viewpoint in its earlier stages, but developed a relative Frame of Reference soon after (Pyers et al. 2010). The factors that may underlie the development of Frames of Reference in sign languages are discussed further in section 16.2.

Chapter 11 also identified a surprising discrepancy between the responses of Kata Kolok signers in linguistic and cognitive tasks. In both the reconstruction of the small-scale Man and Tree arrays by the directors (after 90° rotation), and the Animals in a Row task (after 180° rotation), no strong absolute pattern could be identified. In the Man and Tree task in particular, asymmetry was found between the ways that lateral and sagittal stimuli were reconstructed, suggesting that the axes at which participants rebuilt the arrays were motivated by neither egocentric nor geocentric conceptualisations. The second finding is that while Kata Kolok signers do not show a clear preference for relative or absolute responses in the cognitive tasks, they do pay attention to the facing information of the objects within spatial arrays throughout the cognitive and linguistic tasks. This scene-internal orientation information is crucial to the identification of the intrinsic Frame of Reference. From these results, one might hypothesise that the intrinsic Frame of Reference plays a prominent role in the language, too. A methodological issue in interpreting this observation is that intrinsic cues are naturally entailed in both absolute and relative response patterns. Additional experiments would be needed to rigidly test whether Kata Kolok signers are attentive to intrinsic cues, while not foregrounding the relative and absolute Frames of Reference.

One possible explanation that reconciles the patterns found above is that the geocentric construction of discourse by Kata Kolok signers is akin to a Landmark-based system rather than a truly absolute Frame of Reference. The confusion can

easily be made because a Landmark-based system is “pseudo-absolute” (Bohnenmeyer & Stolz 2006). What often may look like absolute coding in a local context might therefore be essentially a Landmark-based system in which directions converge radially around a Landmark rather than fixed bearings. Such radial convergence around Landmarks indeed best classifies Kata Kolok’s locative pointing system, which is based on the indication of geographic locations. Moreover, as Brown and Levinson (2009) point out, Landmark-based systems have a close cognitive affinity to a supersized intrinsic Frame of Reference, as both are orientation-free. If Kata Kolok signers are indeed using a Landmark-based system rather than a truly absolute system, as do the hearing inhabitants of Bengkulu, one would expect shifts in the direction of ‘absolute’ classifier signs, depending on the recording location with respect to the location of the Narrated Event, similar to the observations made by Wassmann and Dasen (2006). One way to test this hypothesis would be to ask signers to describe the same story while on the other side of Bali.

Additionally, the findings from chapter 11 indicate a true dissociation between the dominant Frame of Reference in language and cognition among Kata Kolok signers. In linguistic description and comprehension, absolute sign-spatial information is highlighted, but during spatial-cognitive tasks Kata Kolok signers do not prefer a single Frame of Reference over the others. This result forms an important contribution to neo-Whorfian questions about the relationship between language and thought in the domain of spatial conceptualisation. First of all, these findings clearly indicate that individuals may adopt genuinely different strategies during the linguistic and cognitive components of the Nijmegen Space Games. The cognitive skills that were adopted in these tasks are thus not wholly determined by linguistic cognition, nor vice versa. Secondly, it would appear that the dominant Frame of Reference within a language is not the only factor that determines a preferential solution in spatial-cognition tasks. Within Balinese culture more

generally, multiple Frames of Reference are in fact favoured, and as such may form a mediating factor in this story (Dasen & Mishra 2010:83; 297). Deaf and hearing villagers of Bengkala share a common culture, but have adopted two distinct modes of linguistic expression: gestural and oral. By comparing the deaf signers, hearing signers, and hearing non-signers of Bengkala we are therefore in a unique position to examine the interaction between language, modality, culture, and cognition through minimally distinct comparisons.

# ***PART V THE KATA KOLOK POINTING SYSTEM: BEYOND SIGN-SPATIALITY***

Part V shows that the meanings of Kata Kolok pointing signs, which traditionally have been analysed based on their sign-spatial reference to locations and associated entities, are in part determined by additional form-meaning mappings unique to the language. Based on the examination of over one thousand pointing signs in spontaneous Kata Kolok discourse, it is shown that the meanings of pointing signs are cued by the context, the construction in which the pointing sign occurs, the formal properties of the pointing sign itself, and simultaneous non-manual markings on the face. While these systematic form-meaning mappings are attested in the literature on pointing gestures in both signed and spoken languages, I argue that we need to compare pointing gestures and pointing signs on equal ground, and this means including all aspects of their semiotic ecologies (see also Goodwin 2003; Kendon 2008; Enfield 2009). Preliminary observations indicate that pointing signs and pointing gestures differ in their relative frequency, communicative load, degree of functional diversification, and compulsoriness, because they are integrated into different semiotic ecologies.

## ***12 Pointing: a brief literature review***

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### *12.1 Overview*

Section 12.2 presents a brief overview of the theoretical relevance of pointing for the social sciences. Pointing occurs in all kinds of interactive settings: in the classroom, in route descriptions, as part of the pronominal paradigms of sign languages, etc. Provided that similar methodologies are applied to this range of settings, data sets from these different ecologies could enable researchers to address fundamental questions about both the universal nature of pointing and its particular features in specific cases, as well as the manifestation of pointing in ‘language’ as opposed to other semiotic systems. Section 12.3 argues that, while most previous studies take the sign-spatial characteristics of pointing for granted, the vector projected by a pointing sign is essentially inadequate for arriving at a full interpretation of the sign. Section 12.4 recapitulates the main theoretical issues surrounding the integration of pointing into the grammars of sign languages. Section 12.5 reviews the cross-cultural conventionalisation of pointing in signing and speaking communities around the world, which informs the development of a research methodology and the coding protocol that is described in more detail in chapter 13. Section 12.6 reiterates the unique perspective provided by Kata Kolok pointing signs with regard to other sign languages. Given the high frequency and the many functions of pointing in signed discourse, understanding Kata Kolok’s pointing system is judged to be key to understanding the language more broadly.

### *12.2 Pointing: theoretical issues*

Philosophers, linguists, psychologists, and other students of the human mind have had an interest in pointing for almost a century. Pointing has been understood as the embodiment of the puzzle of ostensive reference (Wittgenstein 1953), the foundation of human social cognition (Povinelli, Bering, & Giambrone 2003;

Tomasello 2006; Gómez 2009), a primordial form of language (Kita 2003), and as a proto-linguistic form of communication in infants (Tomasello 2006; Tomasello, Carpenter, & Liszkowski 2007; Liszkowski, Schäfer, Carpenter, & Tomasello 2009). Ethnographic descriptions have shown that pointing has become conventionalised formally in culture-specific ways (see for instance Sherzer 1973; Wilkins 2003; Kendon 2004). Pointing signs are immanent to the grammars of sign languages, where they function as locatives, personal pronouns, and auxiliary verbs, among other things (see for example Friedman 1975; Fischer 1996; Pfau 2011). Pointing is also used by blind toddlers who grow up without a visual model of communication (Iverson, Tencer, Lany, & Goldin-Meadow 2000).

As far as we know, all human cultures point, while the pointing abilities of other species are rudimentary in comparison (Kita 2003). Pointing behaviours are used in a range of semiotic ecologies including infant-caregiver interaction, co-speech gesture, and the grammars of sign languages. Pointing in these three semiotic ecologies will be referred to as infant pointing, pointing gestures, and pointing signs, respectively, as they are commonly described and discussed in the literature from these three fields. Although pointing is apparently a ubiquitous phenomenon, there are also culture-specific and language-specific pointing conventions. As such, this study not only taps into the universal aspects of the human mind, but also into the particular manifestation of pointing within a sign language, ultimately addressing the nature of ‘language’ as opposed to other semiotic systems. That is to say, the analysis of the Kata Kolok pointing system as it functions *in situ* can be compared with other pointing systems that reside in other semiotic ecologies (see also Goodwin 2003; Kendon 2008; Enfield 2009). In order to do so, a definition of pointing is needed.

What constitutes pointing? The typical image of pointing is of two people in conversation, one of them outstretching his/her arm and index finger towards a location at which both individuals direct their attention. Although this is a

simplified image, it contains two important clues as to what is generally understood to constitute pointing. Firstly, pointing is a communicative move that aims to direct someone's attention towards a referent. Secondly, the move projects a vector in the direction of the intended referent by using a body part, usually an index finger. There are several arguments in favour of refining this typical description of pointing in order to create a more accurate picture informed by the whole range of pointing phenomena found around the world.

First of all, when an individual directs his/her interlocutor's attention through pointing, this does not always result in a change in gaze-direction on the part of the interlocutor. Pointing can be subtle in form and associated with insecure meanings, and for this reason, it does not have to result in a change of gaze direction (such insecure pointing signs are called 's' points; Enfield et al. 2007). People attempting to instruct their dogs to fetch a ball are pointing, albeit perhaps unsuccessfully. Similarly, pointing signs in sign languages do not usually evoke a redirection of eye gaze by the interlocutor (Pizzuto & Capobianca 2008). In other words, it is not always possible to verify whether the pointing behaviour resulted in a redirection of the interlocutor's attention, and even if it has not - as in the case of a dog - the gesture may still be intended as a point.

A second aspect of the typical definition of pointing that needs adjustment is that, while the indicated location is indeed a clue to the relevant referent, it need not be at the location. The referent merely needs to be associated with that location, such as a person who was standing at the location a minute ago, for example. People are known to point at an empty stool to indicate an individual who has temporarily left the scene. In fact, infants as young as 12 months have already acquired this ability to point to absent referents (Liszkowski, Schäfer, Carpenter, & Tomasello 2009). Furthermore, in cases where points are made to a location that is not in the direct vicinity of where the conversation takes place, one may not be sure as to whether the referent is actually present in that location at that moment. The

pointing sign is motivated by the location of the relatum rather than the referent's current position in space. This becomes particularly evident in sign languages from the use of list buoys; there is nothing inherent in the location on the fingertip which sanctions the direction of these pointing signs. The location on the fingertip essentially functions as a relatum which can subsequently attain very different meanings. Similarly, a pointing sign may create a deictic association with a location in the signing space rather than presupposing that the addressee possesses knowledge of such a connection between that location and the intended referent.<sup>86</sup> This aspect of pointing - being creative and presupposing to varying degrees - is an essential feature of deictic elements (Silverstein 1976).

Although index finger pointing seems to be most common by far, it is certainly not the only articulator that is used for pointing. One may use various body parts, including various hand configurations: the middle finger (Wilkins 2003), the 'full hand' (Kendon 2004), the 'horned' hand (Wilkins 2003), the thumb (Kendon 2004), and the pinky (observed by the author in Dutch co-speech gesture). Other bodily articulators include the head and lips (Sherzer 1973; Wilkins 2003; Enfield 2009:68ff), and the foot (observed by the author in Bali during fieldwork). So-called deictic gaze can also be used to indicate referents (Liddell 2003:108; Wilkins 2003:185). Finally, tools can be used to point: a laser beam, for instance, or twigs (see for instance Green (2009) on how such physical tools are used to construct cohesive discourse in so-called 'sand stories'). These latter kinds of diagramming strategies, which adopt physical tools to point, may be as fundamental to human communication as pointing, and they appear to rely on similar social skills.

Pointing towards a referent may involve touching, such as when indicating a diagram drawn on a whiteboard, or when signers indicate themselves by touching

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<sup>86</sup> List buoys are discussed in more detail in Section 7.4.



their chests (see also section 1.4.2). In touching, the projected vector is minimal, yet the puzzle of ostensive reference is not solved. In other words, the interlocutor still needs to identify the precise referent that is pointed at; in the example of pointing to a whiteboard, the potential set of referents could include the author of a given theory, the concept represented by a diagram, or an arrow in the diagram itself.

In order to come to a full understanding of pointing as a human mode of interaction we need to encompass all the instances of pointing described above. For present purposes, I take the following definition from Enfield, Kita, & de Ruiter (2007) as a start:

“We defined a pointing gesture as a communicative bodily movement which projects a vector whose direction is determined, in the context, by the conceived spatial location, relative to the person performing the gesture, of a place or thing relevant to the current utterance.”

Enfield et al. 2007:1724

In my view, two elements of this definition should be omitted. Firstly, “relative to the person performing the gesture” may not always be accurate. Despite a common belief, the directions of pointing signs can be based in different spatial conceptions, including relative pointing, but also absolute pointing (see Haviland 1993; Levinson 2003:227-43; Gaby 2006). Section 6.3 addressed the distinctions between these types of pointing in detail and determined that Kata Kolok pointing is predominantly geographically motivated. Secondly, “in the context” and “relevant to the current utterance” are redundant as there is already a conceived location and thus a relevant context to the current utterance. Further, the definition provided by Enfield and his colleagues does not capture the fact that the referent of a pointing gesture does not always inhabit the indicated location, but need merely be associated with an entity at the designated location. The present thesis thus adopts the following, more precise definition: **pointing is a communicative bodily**

**action that projects a vector whose direction is determined by the location of a relatum which may be the referent or be associated with the referent.**

Although pointing signs are usually defined by the fact that they indicate a location, the location at which the speaker or signer points or even the object to which one points underspecifies the intended referent. The following thought experiment illustrates this observation that was famously made by Wittgenstein (1953). Imagine a pointing gesture directed at a chair, and think about what it could mean. The first meaning you might infer is that the intended referent is the particular chair that the point is directed toward. After a while, however, countless options may arise, including the kind of chair, chairs in general, the ‘brand’ of the chair, the person who was sitting in the chair a moment ago, or perhaps a particular property of the chair, such as its colour or fabric, and anything in the space before or behind it. At this point one realises that the pointing gesture could refer to many aspects of the chair, as well as to associated referents. This issue is called the problem of ostensive reference, that is, the philosophical puzzle of how, for instance, a child makes the relevant connection between words and the things he or she observes in the real world (see for instance Wittgenstein 1953). The present study addresses this problem from an empirical viewpoint: what cues do signers use to identify the referent of the pointing sign?

Going back to the example above, now imagine the minimal amount of contextual information that would allow you to come closer to determining the correct answer. It would help if you knew more about the chair that is pointed at. Does the chair have any salient properties? What has been said along with the gesture, and who said it? In this case, let's say your conversational partner is a designer furniture salesman who points at a Gispén brand chair and says “they have gone out of business, you know.” You may consequently come to the conclusion that your conversation partner intended the referent ‘the company Gispén,’ rather than this specific chair, chairs in general, Gispén chairs, the colour

green, the texture of the fabric, or your nephews who had just climbed onto the chair. Interpreting a pointing gesture requires this identification and unification of contextually relevant cues, a process which spontaneous language use brings about, whether in the case of infant pointing, pointing gestures, pointing signs, or in conversations more generally (see for example Clark 1996; Enfield 2009).

### *12.3 The sign-spatial indeterminacy of pointing*

Pointing was defined above as a bodily action that projects a vector whose direction is determined by the location of a relatum which may be the referent or be associated with the referent. It is important to realise, however, that this sign-spatial direction of pointing necessarily underspecifies the location of the relatum. This indeterminacy has been addressed in various studies dealing with pointing phenomena, most specifically in the experimental and computational studies into multimodal deixis (see for instance Kranstedt, Lücking, Pfeiffer, Rieser, & Wachsmuth 2006; van der Sluis & Krahmer 2007). For the purpose of the current analysis, I find it useful to distinguish between three types of sign-spatial indeterminacy: horizontal, distal, and vertical.

#### *Horizontal indeterminacy*

Horizontal indeterminacy concerns the fact that, along the projected vector, there is a theoretically infinite number of potential locations to which the pointing sign could refer. In other words, if one were to point in any given direction, any mathematical point along the projected vector could potentially hold the referent. Figure 12.1 illustrates horizontal indeterminacy schematically; the arrow represents the projected vector along the horizontal axis, and the dots represent potential referents.



**Figure 12.1** Horizontal indeterminacy of the projected vector

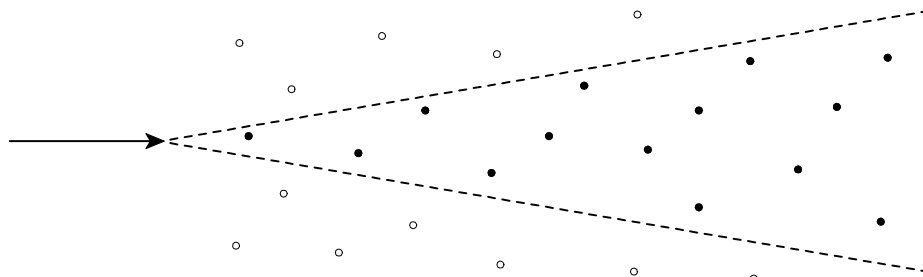
Consider the example of the chair explained in section 12.2: how does one really know whether the projected vector is motivated by the chair specifically, rather than by a person standing behind that chair, or the window behind it, or even something visible outside the window? All pointing behaviours exhibit this fundamental vagueness when only their sign-spatial properties are taken into account.

#### *Distal indeterminacy*

Distal indeterminacy concerns the fact that the vagueness of the sign-spatial vector becomes greater with distance. Figure 12.2 below illustrates this distal indeterminacy schematically. Similar to Figure 12.1 above, the arrow represents the vector, and the dots represent potential referents. In contrast to Figure 12.1, however, the diagram in Figure 12.2 represents affairs from a bird's eye perspective. The dashed lines on both sides of the arrow represent the borders of the search domain that is determined by the vector. The black dots represent locations within this search domain, and the white dots are locations that fall outside of the search domain. The divergence of the lines illustrates the fact that the search domain increases with distance, thus incorporating more potential locations and becoming less precise.<sup>87</sup>

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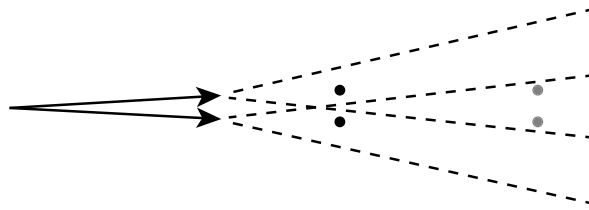
<sup>87</sup> This phenomenon is also known as the pointing cone (Kranstedt et al. 2006) and the Flashlight Model of pointing (van der Sluis & Krahmer 2007:152).



**Figure 12.2** Distal indeterminacy of the projected vector

One way to think about distal indeterminacy is to imagine pointing out a particular type of biscuit, which is on a plate full of a variety of biscuits. Now imagine the same plate on the other side of the room. It has now become virtually impossible to indicate the specific biscuit you want using pointing alone. As a result, you may pick a different referential strategy in requesting it, by using a lexical construction such as “the one with the cherry on top,” for instance (see van der Sluis & Krahmer 2007 for this inverse relationship between utterance length and proximity of the referent). The way that pointing signs are specified in order to select a unique referent in Kata Kolok is a recurring theme in chapter 14.

Due to the distal indeterminacy of pointing signs, a small change in the angle of the pointing sign can adequately differentiate two referents that are in proximity to one another and to the signer. Contrastingly, when those two referents are at the same distance from one another but further removed from the signer, an identical change in the angle is insufficient to single out the referent, as illustrated in Figure 12.3. The black dots are at an equal distance from one another and from the signer and they are distinguished by a  $6^\circ$  change in the angle between the two vectors. The grey dots are at the same distance from each other as the black dots, but they are further removed from the signer and are not differentiated by an identical change in the projected vector. In other words, distal indeterminacy increases with distance.



**Figure 12.3** Distal indeterminacy increases with distance

It should be noted that when the relatum is outside of the visual range, a number of additional factors influence the acuity of absolute pointing gestures. The aptitude to accurately estimate the direction of a distant location appears to be facilitated by the active use of a dominant absolute Frame of Reference (Levinson 2003:126-129; 227-240). This aptitude can however be obscured by particularly circuitous or fast travel, or skewed by the spatial categorisation of a local landmark such as the wall inside a house (Levinson 2003:234-236). The section below discusses a final type of geometric indeterminacy and how it relates to the visibility of the referent.

#### *Vertical indeterminacy*

The indeterminacy of the projected vector manifests itself not only in the horizontal, but also in the vertical dimension. I will refer to this third type of vagueness as vertical indeterminacy. Since the direction of a pointing sign is motivated by the conceived location of a referent, a location at a higher elevation naturally results in a raised pointing sign. Additionally, Kata Kolok signers also indicate distal locations with an elevated pointing sign, although the location may not be at an elevated level. A raised pointing sign is thus ambiguous, as it may indicate a nearby referent at a higher elevation, or any distal referent, or specifically a distal referent at a higher elevation. Figure 12.4 illustrates this vertical indeterminacy. The arrow represents a side-view of a vector, and the black dots represent potential referents. Most notably, the second dot from the left and

the rightmost dot are at the same elevation, but at a large distance from one another.



**Figure 12.4** Vertical indeterminacy of the project vector in Kata Kolok

Vertical indeterminacy has been reported for the pointing gestures of various communities that speak languages with a dominant absolute Frame of Reference: see, for instance, reports of Guugu Yimithirr, Tenejapan, and Arrernte (Haviland 1993:26; Levinson 2003:261-2; Wilkins 2003:187). Moreover, Wilkins observes that the visibility of the referent usually resolves the ambiguity between the indication of a proximate, elevated referent and a distal referent; proximate referents will be visible and thus pre-empt an interpretation of a distal referent. Section 14.2.1 further discusses the formal markers of distal pointing signs in Kata Kolok.

The sections above have argued that the accuity of pointing varies as a consequence of general human perceptual abilities and basic geometry. The three identified types of indeterminacy demonstrate that the ways in which pointing singles out the location of the relatum are not fully calculated from the sign-spatial direction of the points. Furthermore, the ability to accurately point to an invisible relatum also varies from one population to the next as a consequence of linguistically foregrounded and culturally reinforced Frames of Reference. Speakers of languages with a dominant Absolute Frame of Reference are particularly adept in pointing at such distant locations, while the accuracy of speakers from languages of language with a dominant Relative Frame of Reference is feeble in comparison (Levinson 2003). All in all, it appears that the sign-spatial

characteristics of pointing behaviours are featured by both universal and particular cognitive mechanisms.

In addition to the sign-spatial indeterminacy of pointing signs, there are a number of semiotic mechanisms that facilitate the full meaning potentials of pointing gestures and pointing signs. The puzzle of ostensive reference reveals that even a single relatum can refer to multiple referents. Furthermore, the location that determines the direction of a pointing sign can in itself refer to another location through a deictic shift called deixis at phantasma (Bühler 1934).<sup>88</sup> More generally, individuals point at locations that are associated with a non-locative referent, for example, pointing at the chair to indicate ‘the Gispen company’. This phenomenon is known as deferred ostension (Quine 1960). These ambiguities raise the question of what cues contribute to a full understanding of pointing on the part of the interlocutor. Although one important element of referent resolution is based on extra-linguistic elements in the physical context, such as when the location and its referent are within visual range, even when a location has been identified and the referent is visible, the example of the chair described above shows that sign-spatial information is not sufficient to retrieve the full meaning of a pointing gesture, and that the context of the discourse contributes as well. For these reasons, pointing signs need to be examined *in situ*, taking into account all contextual cues that might contribute to their full meaning potential.

#### *12.4 Grammatical indeterminacy of pointing signs*

In sections 1.4.2 and chapter 7 of this thesis, pronominal pointing signs and their functions are described in detail. This overview showed that many discussions regarding the grammatical status of certain types of pointing signs have revolved around their sign-spatial nature. This is surprising given the fact that sign-spatiality

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<sup>88</sup> Section 5.3 of the thesis addressed this phenomenon in detail.



generally underspecifies the full meaning potential of pointing signs and it is just one of the cues that inform their meanings (section 12.3). Previous studies on pointing signs seem to converge on the same question in the discussion regarding the grammatical status of pointing in sign languages, that is, is the sign recognisable as a token of a particular type outside of the context? Johnston (2010) has recently rejected the analysis of pointing signs in sign languages as pronouns based on the fact that a large part of their meanings, including their grammatical functions, have to be retrieved from discourse, rather than systematic form-meaning mappings. While the fact that pointing signs are grammatically under-determined outside a discourse context might seem odd at first sight, it is not unheard of for words in spoken languages to function in this way (see for example Gil 2009). Even in a language such as English, many words are ambiguous with respect to word class outside their context. Syntactic and semantic generality is not an exotic, but rather an intricate aspect of human communication (Levinson 2001:8ff; Enfield 2009). Moreover, although many sign language researchers acknowledge that context is essential to interpreting pointing signs, they lack a formal description of what constitutes ‘context’. This study aims to clarify the notion of context, and look beyond the sign-spatial properties of pointing signs by focussing on the formal conventions of pointing signs and analysing the physical and the discourse context that contributes to their full meaning in instances of usage.

### *12.5 Form-meaning mappings of pointing gestures and pointing signs*

In the past decade, a growing body of studies has shown that, in addition to contextual cues, pointing gestures and pointing signs also exhibit formal conventions that inform their final interpretations. The form of a pointing sign can be motivated by the nature of its referent in multiple ways: the information status of the referent, the grammatical function of the pointing sign, and a judgement regarding the referent on behalf of the speaker, among other things. A number of

studies show that the information status of index finger points may determine their formal properties. For example, Lao speakers formally mark the pragmatic load of pointing signs (Enfield et al. 2007). That is, in order to indicate foregrounded spatial information, Lao speakers use big (B) points similar in form to the typical pointing gesture. These pointing signs do not necessarily require spoken language for their resolution. By contrast, Lao speakers use small (s) points when the spatial reference is not foregrounded and is insecure in terms of common ground. In Danish Sign Language, the distinction between referential and predicative pointing signs is marked by palm orientation (Engberg-Pedersen 2003). Predicative pointing signs, which state the location of an entity, are produced with a pronated forearm and an extended wrist such that the palm is oriented downward, while referential pointing signs are produced with a neutral forearm position.

In sign languages, pointing signs have been identified as holding a wide variety of grammatical functions, including their use as personal pronouns, agreement verbs, and agreement auxiliaries (see Pfau 2011 for a recent overview). These functions are also formally marked by parameters such as handshape, movement and co-occurring non-manual signals. For example, several sign languages have a set of possessive pronominal forms that are produced with all the fingers or a fist rather than an index finger (Lutalo-Kiingi 2008; Chen Pinchler & Hochgesang 2008; de Weerdt & Vermeerbergen 2008). In Danish Sign Language, place reference is made with “an index finger that is straight, hooked, or bent at the first knuckle [...] and a straight movement in the direction of the tip of the index finger followed by a final hold or a rebound and a hold”. Conversely, the directional verb GO-TO “is made with a slightly bent finger and an arc movement parallel with the index finger” (Engberg-Pedersen 1993:123). Finally, it has been argued that pointing direction and eye gaze patterns may distinguish grammatical person in American and Brazilian Sign Languages (Berenz 2002). This issue has been a matter of debate, however (see Meier 1990).

The formal encoding of grammatical categories is not restricted to pointing in sign language. A cross-linguistic comparison of pointing gestures shows that communities have specific, formal conventions (Wilkins 2003; Kendon 2004; Enfield 2009). Speakers of Arrernte, for instance, use a wide variety of handshapes that form system-internal oppositions (Wilkins 2003). According to Wilkins, a subcategory of Arrernte pointing gestures act as plural markers where the spoken word does not distinguish between singular and plural forms. This latter observation suggests that in some cases, pointing may attain grammatical functions when accompanying speech, too. Section 15.6 will address this possibility further, alongside issues regarding the comparison of pointing signs and pointing gestures.

#### *12.6 Previous work on Kata Kolok pointing*

Previous analyses of the Kata Kolok pointing system have attested several striking features compared to other sign languages. Zeshan (2006b:64) reports that, unlike all urban sign languages documented to date, Kata Kolok signers do not establish loci in the neutral signing space, but “almost always set up discourse references in correspondence with absolute real-world locations”. Part III showed that this observation holds across the three main deictic domains: location, person and time. Locative pointing signs are motivated by geographic locations, and in person reference, signers also indicate the direction of the geographic location of the referent’s home base (see also Washabaugh 1986:36 on Providence Island Sign Language; Sandler et al. forthcoming on Al-Sayyed Bedouin Sign Language; Levinson 2007 on Yélf Dnye). Furthermore, Kata Kolok signers indicate the time of day by using a celestial timeline: they point to the sky, following the course of the sun to indicate temporal information. In summary, the Kata Kolok pointing system is dominated by geographic locations rather than grammatical loci (Zeshan, Marsaja, & de Vos in prep.).

Marsaja (2008:162-164) notes that pointing takes a wide variety of forms in Kata Kolok. Signers produce pointing signs with and without a fully outstretched arm, with the index finger moving as if tracing an arc, or with a short ‘tense’ movement indicating a distant location. Locative pointing signs in Kata Kolok are frequently produced in a signing space that stretches far beyond the articulatory space of other sign languages (cf. Klima & Bellugi 1979); signers regularly point toward the signing space behind them to indicate discourse referents (section 6.2). These observations seem to indicate that the Kata Kolok signing space is more similar to the gesture space of communities with a strong absolute Frame of Reference (Levinson 2003:264-6), rather than the signing space of other (urban) sign languages. According to Marsaja, when indicating time by pointing to the regular position of the sun at that time of day, an angular difference of 15° can distinguish one clock hour from the next. Celestial pointing and the appropriateness of a categorical analysis for clock hours are discussed in section 14.4.

Finally, Perniss & Zeshan (2008) discuss the Kata Kolok pointing system as it relates to possessive, locative, and existential constructions. Unlike other sign languages Kata Kolok does not have distinct possessive pronominal forms. Pronominal possessors, just as other pronominal forms, are indicated by an index sign directed at those individuals concerned. Perniss and Zeshan also note that first person forms occur both before and after the possessum and that all forms can be modulated with respect to duration, or be repeated to indicate emphasis. Pointing signs that indicate people are investigated in more detail in section 14.3. In addition to the core domains of location, person, and time, Kata Kolok pointing signs have also been found to indicate body parts and colours (de Vos 2011; section 14.5).

The ubiquity of pointing signs in spontaneous discourse, as well as the wide variety of functions that pointing signs fulfil, make it clear that the description of the pointing system is key to understanding the structure of Kata Kolok. The

chapters 13 and 14 aims to chart the system, including all factors that have been reported to contribute to the interpretation of pointing: situational context, discourse context, formal properties, and non-manual markers. Each of the descriptions focuses on a semantic domain of referents to which Kata Kolok pointing signs may refer: locations, people, times of day and night, body parts, and colour. The question of whether the Kata Kolok pointing system should be considered to be grammaticalised is revisited in the final discussion of chapter 15.

### *12.7 Summary and discussion*

This chapter has presented an overview of the ways in which pointing has been analysed in the literature. The literature on sign languages has focussed on the sign-spatial nature of pointing signs, but in many cases the location pointed at underspecifies the referent. In co-speech gesture and in sign languages alike, the meaning of pointing signs is informed by the situational and discourse context. Furthermore, the formal characteristics of pointing signs, as well as the simultaneous production of non-manual markers, have been assigned grammatical functions in the literature on both pointing signs and pointing gestures. This grammatical analysis of pointing signs has been a widely debated topic in the sign linguistic literature for the past two decades, and linguists have not arrived at a consensus regarding the criteria that define the grammaticality of pointing. It is argued here that in order to establish the relative grammaticality of pointing gestures and pointing signs, comparable data sets from different languages should be analysed. In this context, it will prove instructive to assess Kata Kolok pointing signs within the semiotic ecology in which they have evolved.

## ***13 Corpus analysis of spontaneous pointing signs***

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### *13.1 Overview*

The previous chapter defined pointing as a communicative bodily action that projects a vector whose direction is determined by the location of a relatum which may be the referent or be associated with the referent. This definition includes multiple sign-spatial phenomena that were also addressed by Part III of the thesis. This chapter presents an overview of the analysis of the Kata Kolok pointing system. Section 13.2 describes the spontaneous data that were selected from the Kata Kolok corpus. Section 13.3 lays out the formal and functional coding categories that were applied to the corpus based on the issues discussed in the literature review in the previous chapter. The Pointing Coding Scheme can also be found in Appendix IV. Section 13.4 presents some general outcomes of the corpus analysis.

### *13.2 Data collection: spontaneous Kata Kolok pointing signs*

The previous chapter identified two main research questions: which cues contribute to the interpretation of Kata Kolok pointing signs? And, ultimately, what are the differences between pointing signs in spoken and signed semiotic ecologies? Both are best approached through the analysis of naturalistic data. In the case of the first question, it is important to consider contextualised examples, because research on pointing shows without doubt that both the situational and discourse context are crucial to arriving at a complete understanding of pointing. In order to address the second question, comparable contextualised data from both signed and spoken ecologies are required. As mentioned in section 1.5, however, the analysis of Balinese co-speech gestures falls beyond the scope of this thesis. By including the full range of cues that are available to people in both semiotic ecologies, we will not arbitrarily omit information that might prove significant for the interpretation

of pointing in specific instances. For these reasons, a data set consisting of spontaneous, signed conversations was selected to enable the investigation of not just the formal properties of pointing signs but also the contextual cues that may be used for their resolution in usage.

The data that were analysed were drawn from two sources. Firstly, 4 hours and 6 minutes of video data collected and transcribed sign-by-sign by I Gede Marsaja and Waldemar Schwager were only included to obtain data on general frequencies of pointing signs (see section 13.4). The second data set, which was collected and transcribed by the author for the purposes of this study, constitutes an additional 1 hour and 55 minutes of spontaneous video data, and over one thousand pointing signs. These latter recordings feature 10 deaf individuals from Bengkulu in one monologic narrative and five dialogic conversations. I transcribed the files indicated by bold face in Table 13.1 in detail with a system of notation designed to code both formal and semantic properties (as described in 13.3 below). Table 13.1 provides details on the two data sets that were analysed to determine the frequencies, functions, and forms of pointing signs in spontaneous Kata Kolok discourse. As mentioned in section 3.4.2, additional details concerning metadata are available from the website of the Max Planck Institute for Psycholinguistics in Nijmegen and can be accessed on the basis of the file names.

DATA SET	PARTICIPANT CONFIGURATION	FILE NAME	TRANSCRIBED VIDEODATA
<b>Set A</b> I Gede Marsaja & Waldemar Schwager 2000 – 2005	Multi-participant conversation	PndGardenChD3	21 minutes
		KK_KntStory	35 minutes
		RoosterpetDnC2	18 minutes
		PndKubuGatheD2	20 minutes
		Evening-chatA2	14 minutes
		KK_CS_Wkolok	16 minutes

<b>Set B</b> Connie de Vos 2006 – 2009		KK_Posses_Sdr	12 minutes
		DucksoupcookD4	15 minutes
		KK_Absol_Dn	12 minutes
		DepartureparD5	10 minutes
		KK_Absol_Sdr	14 minutes
		KK_StoryKntLnd	12 minutes
		SrntNightHomD1	5 minutes
		KK_Ngrdan	6 minutes
		ComGatherChaA4	4 minutes
		TuakSndHomeC5	5 minutes
		TempleRitualA3	4 minutes
	Two-participant conversation	KK_BdyStory	7 minutes
	Monologue	<b>KK-InthehutDn1</b>	<b>16 minutes</b>
		<b>Gta6oct7</b>	<b>16 minutes</b>
	Two-participant conversation	<b>PiKe4jan7</b>	<b>18 minutes</b>
		<b>ReKe10jan7</b>	<b>24 minutes</b>
		<b>SuJu16jan7</b>	<b>24 minutes</b>
		<b>KN5jan7</b>	<b>7 minutes</b>
		<b>GD3jan7</b>	<b>26 minutes</b>

**Table 13.1** Details of data sets used to identify the frequencies, functions, and forms of Kata Kolok pointing signs

### 13.3 Coding of pointing signs

Pointing signs in the sign literature are often glossed exclusively based on the location in the signing space that they point towards, e.g. "3a" and "3b" to indicate a location on either side of the signer. Given that these pointing signs often refer to third person referents, this glossing makes some sense (Meier 1990; Bos 1994). However, the formal coding scheme presented in the sections below focuses specifically on the formal characteristics of pointing signs as distinct from their



sign-spatial direction. In particular, it includes categories for the articulator type, the shape of the articulator, the movement patterns, and palm orientation. In addition, non-manual signals are also included in the coding. The functional part of the coding scheme focused on the contextualised meaning of pointing signs and their grammatical function within the sentence. Both types of coding are explained in the sections below. Appendix IV presents a complete overview of the Pointing Coding Scheme.

#### *Articulator type*

In Kata Kolok, pointing signs can be produced by five distinct articulators: the eyes, the lips, the head, the foot, and the hand. Although all five varieties of pointing have been observed during fieldwork, the use of the head, foot and lips is not attested in the corpus of spontaneous Kata Kolok data (see section 3.4.4 for a description of this portion of the corpus). The specific functions of these non-hand pointing behaviours could be the reason for their absence. For example, pointing with the foot is considered an insult in Balinese cultures, and is therefore expected to be infrequent. During fieldwork, I have observed deaf signers to point with their heads and/or lips, but only when the hands were used to hold an object. Lip pointing has been reported for other cultures as well, but there is no large-scale cross-cultural comparison of the phenomenon (but see Sherzer 1973; Wilkins 2003; Enfield 2009:68). In these studies, closer analyses have indicated that lip pointing is probably not restricted to those cases where the hands are unavailable for pointing, and this may also be the case if one were to have a closer look at lip pointing in Bali. In the spontaneous signed data used here, however, head and lip points have not been found to be integrated into Kata Kolok discourse.

#### *Dominant versus non-dominant hand*

For each pointing sign, I have indicated whether the sign was produced by the signer's dominant or non-dominant hand. Left and right-handedness has often been

described as a permanent characteristic of a signer, as displayed by the preferred hand for one-handed finger-spelling and the phonological base hand in asymmetrical two-handed signs. What is more, the non-dominant hand has been reported to serve several linguistic functions in sign languages (Sandler 2006; Nilsson 2007; Vermeerbergen, Leeson, & Crasborn 2007). All deaf adults using Kata Kolok are illiterate and the language has no indigenous finger spelling system. For this reason, the non-dominant hand was identified as the base hand in the most recently-used asymmetrical, two-handed sign in the text. For the Kata Kolok data, the coding category for handedness turned out to be difficult to implement as signers were observed to switch dominant hands during discourse.<sup>89</sup> Handedness can in principle also be operationalised on the basis of preferential tool handling, but there is a strong left-hand taboo in Bali and children are taught from an early age onwards to use their right hand (Dasen & Mishra 2010:84). For this reason, the use of the right rather than the left hand in such tasks may not be a reliable measure of handedness within the Balinese context.

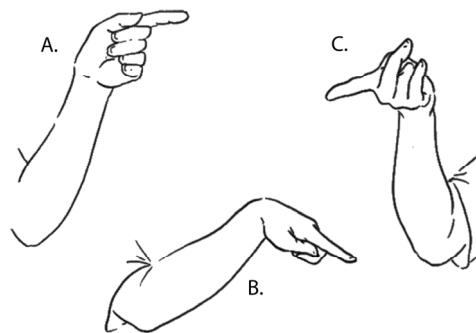
#### *Palm orientation*

Pointing with the index finger or with the full hand abounds in Kata Kolok discourse. For pointing signs produced by the hand, palm orientation varies gradiently. The coding scheme distinguished three degrees of rotation: a downward palm orientation, an upward palm orientation, and a neutral palm orientation. Figure 13.1 displays typical examples. Work on other sign languages has suggested the relevance of palm rotation. For instance, Engberg-Pedersen reports that in Danish Sign Language pointing signs with a referential function are produced with

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<sup>89</sup> Similar observations have been made for the corpus of Sign Language of the Netherlands by Sáfár, Crasborn, & Ormel (2010), and the role of the non-dominant hand in manual simultaneous constructions is currently the subject of a PhD project by Anna Sáfár within the Sign Language Research group at the Radboud University in Nijmegen.

a neutral palm position and pointing signs with predicative functions are produced palm downward (Engberg-Pedersen 2003).



**Figure 13.1** Palm orientation  
Neutral (A), downward (B), and upward (C)

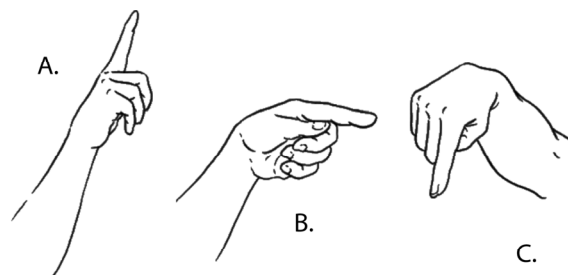
#### *Articulator shape*

In addition to the palm orientation and the articulator type, the coding scheme also took into account the shape of the articulator with regard to index finger points. Normal, bent, and lax shapes were differentiated in the coding protocol. The bent hand shape used in pointing is identical with the small C-hand as displayed in Figure 4.4 on p. 82. The lax index finger points is identical with a 5-hand from which the index finger is extended slightly. The bent index finger was found to indicate lower elevations, but for the lax index finger point no unique function could be identified. This suggests that the lax index finger point may be the result of phonological or prosodic processes.

#### *Fingertip orientation*

An additional formal category, fingertip orientation, is only applicable to index finger pointing (see Figure 13.2). In this coding category, the fingertip orientation

is captured by differentiating upward, neutral, and downward forms (see Crasborn & van der Kooij 1997). The upward form is presented in the leftmost still image (panel A) of Figure 13.2. In cases where the fingertip orientation is coded as ‘up’, the fingertip is directed upwards with respect to the palm normally to a maximum of approximately 30°. The still in the middle (B) displays the neutral form, where the index finger is in line with the palm’s orientation. In the case of a downward fingertip orientation, as illustrated by the right-most image of Figure 13.2 (C), the fingertip is angled towards the palm up to 90° (as most people are not capable of making a sharper angle at the metacarpophalangeal joint of the finger).



**Figure 13.2** Fingertip orientation  
Upwards (A), neutral (B), and downward (C)

#### *Movement type*

Pointing signs always have movement of their own in the sense that they are directed towards a location in the signing space. Along with detailed analysis of the formal properties of pointing signs, the coding scheme differentiated between two additional movement types: repetition and movement path. When the pointing sign was repeated straight away without any other intervening signs, movement was coded as repeated (+mr). When the pointing sign followed a path in the signing space, the sign was coded as +m with a specification of the kind of movement

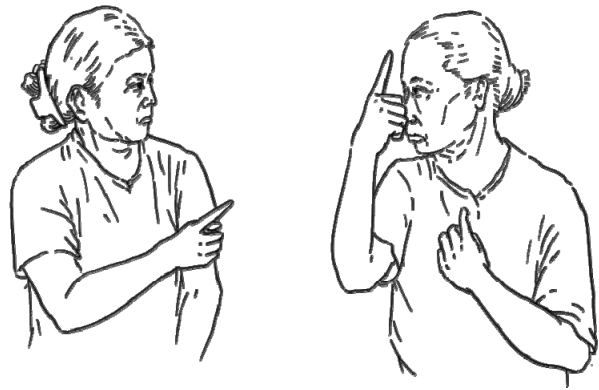
between square brackets: "[zigzag]", for instance. Six movement paths were identified in this data set: straight movement, arched movement, upward movement, downward movement, zigzagging movement, and paths that were directed from east to west. To be coded as straight movement the sign must involve an additional outward movement of the wrist so that the arm reaches a maximum extension. Arched movement refers to the arch-shaped movement trajectory of a pointing sign. Upward and downward movement, refer to movements tracing along the vertical axis. A zigzagging movement was identified a number of times to describe an entity's path while zigzagging through a rice field. A number of these movement paths can be combined, for example, multiple pointing signs combined an arched and downward movement. When the pointing sign was not repeated, and did not have a movement path, it was coded as –m.

#### *Lifted upperarm*

I also coded whether the pointing sign was produced with an extended upperarm by the added annotation "L". The vertical elevation of pointing signs was not coded systematically.

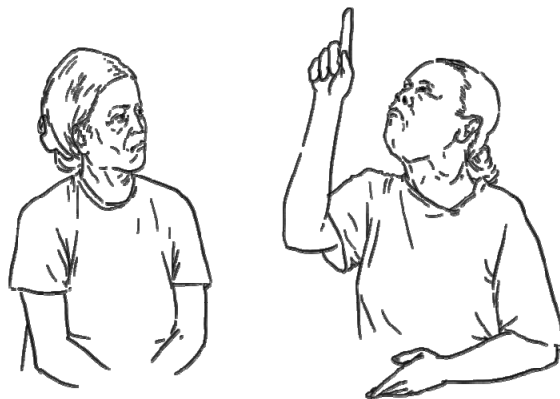
#### *Gaze direction*

While producing a pointing sign, signers use various kinds of non-manual behaviours. Three types of eye gaze are recorded in the coding scheme: eye gaze directed at the addressee, eye gaze aligned with the pointing sign, and eye gaze not directed at either. Figure 13.3 shows a still of multiple pointing signs produced by both signers during which the signers make eye contact with each other rather than following either of the pointing signs themselves.



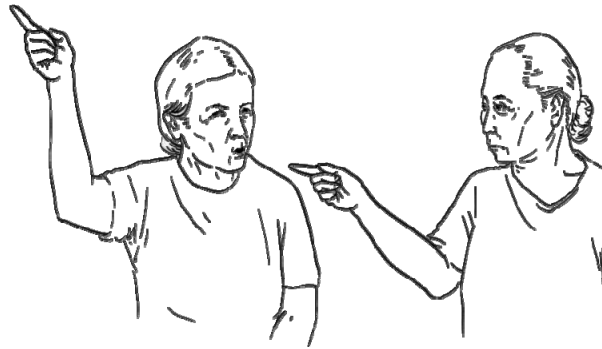
**Figure 13.3** Eye gaze at addressee

Figure 13.4 displays a still in which the signer's eye gaze is aligned with the pointing sign. The addressee (on the left) has her eye gaze directed at the signer (on the right), rather than following the pointing sign.



**Figure 13.4** Eye gaze aligned with pointing sign

Figure 13.5 displays a still image from a dialogue in which both signers point simultaneously. The signer on the left points, but here gaze is neither aligned with the pointing sign, nor directed at the addressee of her utterance. The signer on the right directs her index finger and her eye gaze towards her interlocutor, but no eye contact is made between the signers. This example in particular shows that eye gaze patterns in a (signed) conversation can be rather complex and governed by different layers of communication (for an overview of eye gaze in hearing interactions in varying speech communities see Rossano, Brown, & Levinson 2009).

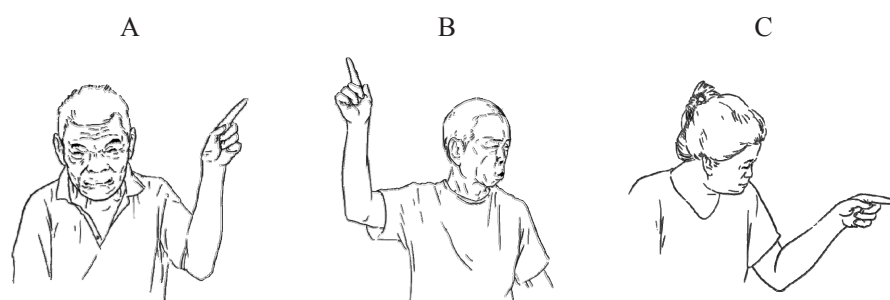


**Figure 13.5** Eye gaze not directed at the interlocutor nor aligned with pointing sign

On rare occasions, eye gaze changed direction during the course of a pointing sign. In such instances, the eye gaze during the maximum extension (apex) of the pointing sign was coded. Eye gaze was not coded independently of pointing signs, and therefore the question of whether it may have an independent indicative function in Kata Kolok remains unanswered.

### *Non-manual signals*

In addition to eye gaze, there are three types of non-manual signals that frequently co-occur with pointing signs: squinted eyes, pursed lips and a head nod. All three are illustrated by stills from the corpus shown in Figure 13.6. These non-manual behaviours are not used with pointing signs exclusively and they are therefore listed in the general transcription conventions in Appendix II. For the same reason, these annotations were added to the general Non-manuals tier in ELAN (see section 3.4.3).



**Figure 13.6** Non-manual signals frequently co-occurring with pointing signs  
squinted eyes (panel A), pursed lips (panel B), and head nod (panel C)

### *Coding the functions of the pointing signs*

The coding scheme initially classifies each pointing sign according to its function: person reference (first, second, third), place indication, or time indication. During coding, two additional categories had to be added: the use of pointing to indicate colours and body parts. In the case of person reference, an indication was also made as to whether the person was present at the scene, and this information was



available from the detailed metadata files. The coding schema also indicated whether reference was made initially with that pointing sign or whether it concerned an anaphoric reference. Whenever the function of a pointing sign was unclear based on the English translations of the text (see section 3.4.3 on how translations and annotations were made), I discussed the sign with my research assistant, who is a native signer of Kata Kolok. We verified the geographic direction of each locative pointing sign to make sure that the direction truly indicated the geographic location it referred to, using a map and compass and the insights of my local research assistant. In addition to these coding categories, the coding scheme also indicated whether the pointing sign referred to multiple referents or to a distant location. In some cases, locative pointing signs refer to other locations, deferred ostension in Quine's (1960) terms. In Kata Kolok, for example, signers pointed towards an airport to refer to 'abroad.' This example is particularly intriguing since this particular airport went out of business a long time ago. I marked cases of deferred ostension in the corpus by 'd.o.' Finally, I also annotated the discourse status of the pointing sign, that is to say, whether it contains referential, predicative, or focal information. Table 13.2 lists these functional coding categories, and a complete list of the annotation categories is available from Appendix IV.

FUNCTIONAL CATEGORY	ANNOTATION LABEL
First person	PS1
Second person	PS2
Third person	PS3
Location	LOC
Object	OBJ (including body parts)
Colour	C
Time	TIME
Multiple referents	#M
Distant location	#DIST
Deferred ostension	d
Reference	R

Predication	P
Focus	F
Entity present at recording session	e

**Table 13.2** Functional coding categories and their annotation labels

### *Coding Process*

The data used for this part of the study constitute 2 hours and 11 minutes of conversational Kata Kolok which has been transcribed in detail by myself (see p. 346). This data set, which is indicated in bold script in Table 13.1, had been translated into Bahasa Indonesia and English and glossed before the analysis of pointing started. These glosses included a sign-by-sign translation as well as non-manual behaviours.<sup>90</sup> The data were selected for the analysis of pointing partly due to the already existing rich annotations that have been made by the author. For the included files two tiers per individual signer were added in the ELAN video annotation software: one for the formal coding categories (Pointing\_Form) and one for the functions of pointing (Pointing\_Function). The research initially determined the contextualised functions of pointing signs, and these interpretation were later checked together with the local research assistant. In a few cases, the research assistant was unsure about the exact referent of a pointing sign. In these cases, the meaning of the index finger point was checked with the signer who produced it. An example of difficulty in determining the referents of pointing was a case where a signer pointed towards a location outside the village to indicate one of his relatives with whom the research assistant was unfamiliar. These initial coding steps resulted in several hypotheses about the types of meaning that are encoded in Kata Kolok pointing signs. To avoid the possibility of these hypotheses having a direct

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<sup>90</sup> Section 3.4.3 explains ELAN annotation software and the transcription process in detail.

influence on the formal coding process, however, the Pointing\_Function tier was temporarily made invisible during the annotation of formal categories.

#### *13.4 General outcomes*

In this section, a few general outcomes regarding the frequencies, forms, and functions of Kata Kolok pointing signs are presented. In determining the frequencies of pointing in Kata Kolok pointing signs, the data collected by Gede Marsaja and Waldemar Schwager and by the author during the present study were combined (see Table 13.1 on p. 347 for details). Further descriptions are based only on the data set collected and annotated for the present study.

##### *Frequencies of pointing signs*

In the combined data set there were 4,373 tokens of index finger pointing signs and 434 pointing signs with the B-hand, out of a total of 33,687 total annotated manual signs that were identified. One in six manual signs is thus a pointing sign in Kata Kolok, which seems extremely high in comparison to spoken discourse, although no statistical data from comparable sources are available to confirm this. It is unclear as to whether this frequency is significantly different from those of other sign languages. The frequency of pointing in the Australian Sign Language Corpus is one in every seven annotations (Johnston 2010b). Engberg-Pedersen (2003) reports one in four signs to be a pointing sign in her data on Danish Sign Language, but it is unclear whether this constitutes a systematic difference between the languages. That is, because her data set was presumably smaller than the Kata Kolok and Australian Sign Language corpora, it might be skewed by focused elicitation in a way that the spontaneous Kata Kolok and Australian Sign Language data were not.

### *Forms and functions of pointing signs*

As mentioned in section 13.2, I supplemented Marsaja and Schwager's data set with additional data that were collected and annotated for current purposes. Table 13.1 presented an overview of the files that were included for this detailed analysis in bold script. These transcriptions reveal that pointing signs fulfil various functions in Kata Kolok including the previously reported indications of geographic locations, person reference, and the indication of time along a celestial timeline in addition to signs indicating colours and referring to body parts. Table 13.3 presents the frequencies of each of these functions in the data set that was annotated in detail. The table shows that first person references and location indications are the most frequent functions of Kata Kolok pointing.

FUNCTION	No. of OCCURENCES	%
Locative	354	(29.9)
First person	282	(23.8)
Second person	125	(10.6)
Third person	71	(6.0)
Time indication	71	(6.0)
Object	38	(3.2)
Other	242	(20.5)
TOTAL	1,183	(100)

**Table 13.3** Functions of pointing signs in spontaneous Kata Kolok discourse

Notably, some coding categories turned out to be driven formally rather than by specific functions within the language. Initial analyses seemed to indicate that palm orientation marks the difference between reference and predication in Kata Kolok (de Vos 2008). However, that generalisation did not stand the test of a larger quantity of data. The overall results suggest that palm orientation is not associated with a single semantic function in Kata Kolok. One of the reasons for this could be

that pointing signs have predicative functions that look very much like the informationally foregrounded B-points described of Lao speakers (Enfield et al. 2007). As predicates are often informationally foregrounded, the function of predication and foregrounding may have initially been confused. However, locative pointing signs that have referential rather than predicative functions are also often foregrounded, and for this reason they can also resemble other B-points. Furthermore, the palm orientation of pointing signs is also influenced by other factors. For instance, it has been reported that pointing signs may assimilate their orientation to that of the neighbouring noun when they function as determiners in Sign Language of the Netherlands (NGT) (Ros, van der Kooij, & Crasborn 2006).

A number of additional coding categories were found to be irrelevant to the analysis of pointing in Kata Kolok. For instance, 131 index finger points produced with the non-dominant hand were identified, which is 15% of the total number of index finger points. But, as mentioned on p. 348, the coding category for handedness turned out to be difficult to apply, and so it was not possible to allocate a unique function to the use of non-dominant index finger pointing in Kata Kolok discourse. Another example is that the articulator shape (lax versus neutral) turned out to be irrelevant to the final interpretation of a pointing sign and rather seemed to be articulatorily-induced variation: all lax index finger points occurred after lexical signs that involve the B-hand. In my view, these null results described above reinforce the argument for using substantial amounts of data when it comes to the analysis of pointing signs. Only when we analyse a large number of data points can we factor out the multitude of aspects that may influence their shapes.

### *13.5 Summary and discussion*

In this chapter, I have presented an overview of the research methodology used to analyse Kata Kolok's pointing system. The general outcomes showed that it is important to include a large number of pointing signs in the analysis, as certain

ostensible ‘patterns’ disappear over larger data sets. A striking finding is that one in six signs is a pointing sign in Kata Kolok, while two previously unattested functions of pointing signs in Kata Kolok were identified: pointing to indicate colours and body parts. The high frequency of Kata Kolok pointing, and the degree of diversification, both formally and functionally, leads to the conclusion that it is crucial to analyse pointing in order to fully understand the language.

## **14 Functions and forms of Kata Kolok pointing**

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### *14.1 Overview*

Sections 14.2-14.4 consider in turn the three major functions that Kata Kolok pointing signs serve: the indication of location, people, and time. Each section investigates which cues lead to a specific interpretation of these pointing signs. Section 14.5 addresses a subset of pointing signs - including those referring to colours and body parts - that has attained a lexical status within Kata Kolok.

### *14.2 Indicating locations*

Section 6.3 corroborated previous reports that Kata Kolok pointing is largely motivated by geographic locations. Section 12.3 addressed the fact that even when indicating geographic locations, the sign-spatial direction of a pointing sign inevitably underspecifies the indicated location. Building on this, section 14.2.1 shows that Kata Kolok pointing signs can be marked, by manual and non-manual modifications, to indicate distance and elevation and that these markers resolve some of the sign-spatial indeterminacy of pointing signs. Section 14.2.2 describes the absence of true toponyms in Kata Kolok, because these locative constructions in the language necessarily include pointing signs that provide a directional instruction towards the actual geographic location. These two sections together suggest that even ‘simple’ locative pointing signs require the integration of multiple cues: sign-spatial information, manual and non-manual modifications, and extra-linguistic, geographic information.

#### **14.2.1 Formal marking of locative pointing signs**

As described in section 12.3, the sign-spatial properties of a pointing sign underspecify the precise location pointed at in multiple ways. Kata Kolok has

developed a range of ways to mark the distance of a location using formal adjustments of the pointing sign itself as well as non-manual signals.

These distance-markers are commonly used in combination, but before considering some examples of complex constructions in detail, it is first useful to list them separately:

- 1) **Upward fingertip orientation:** the index finger is at a sharp angle to the top of the hand (see Figure 13.2 on p. 351).
- 2) **Straight movement:** the pointing sign has a projecting movement from the wrist in the direction of the location at its maximum extension (apex). The stills in Example 14.1 illustrated this.
- 3) **Lifted upper-arm:** the upper arm is level with the signer's shoulder.
- 4) **Vertical elevation:** the articulator sign is raised vertically such that distal locations are produced higher in the signing space than proximate locations (but see section 12.3).
- 5) **Pursed lips:** the pointing sign is produced simultaneously with pursed lips, as illustrated by Figure 13.6 on p. 355.<sup>91</sup>

Example 14.1 comes from a narrative about an event during the Second World War when Dutch officers invaded Singaraja - the city nearest to Bengkulu. The signer was not yet born at the time, but his father told him the story when he was a child. In the video, the signer points to the Singaraja area twice while combining all five distance-markers described above. Still 14.1 displays one of these distal pointing signs; the black arrow indicates its final straight movement.

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91 The use of pursed lips has been identified as a general intensifier in section 4.6.





**Still 14.1** Distal locative pointing sign

Example 14.1 Distal pointing sign

↓ Still 14.1

NM	<u>                    pl</u>	<u>                    pl</u>	<u>                    pl</u>	<u>                    pl</u>
MG	PIDAN + + +	BOSS	IX'Singaraja'	ALL-OVER IX'Singaraja'
ND				

'Back then there were a lot of officers in that area (near Singaraja).'

Gta6oct7\_distalpointing.mpg

Of the five formal characteristics of distal pointing, the fourth - vertical elevation - is notably different from the others because it is an analogical rather than a discrete variable. An increase in elevation results in an increase of distance, while the other distance markers are either present or absent. Moreover, elevation does not disambiguate between nearby locations at a higher elevation, and far-off places (see the discussion on p. 338). It appears that the use of the general intensifier can

be a way of disambiguating, as it indicates distance.<sup>92</sup> That is, when a pointing sign occurs simultaneously with the general intensifier it is interpreted as referring to a distal location. In cases where it is not marked with the general intensifier, the ambiguity may remain based on the formal characteristics of the pointing sign itself. As will become clear throughout later sections of this chapter, however, contextual cues may be just as important as formal properties in identifying the referent of a pointing sign.

Locations that are at a lower elevation than the current setting are marked by the use of a bent index finger, which also occurs in the indication of sunrise and sunset (section 14.4.1). The question arises as to whether the use of this bent finger is the articulatory outcome from the fact that one is pointing downward (as suggested by Crasborn & van der Kooij 2003 for handshapes in Sign Language of the Netherlands), or if it indicates a lower elevation through convention. Note that by using a straight index finger with downward fingertip orientation one may also point downward, for example in the lexicalised pointing sign meaning ‘here’. Similarly, signers can use endophoric pointing signs in the neutral signing space in order to produce a down-scaled map of locations, and these pointing signs point downward, but their index fingers are not bent. This indicates that the use of a bent index finger is not entirely articulatorily motivated.

Kata Kolok signers do not normally inscribe the neutral signing space in front of them with loci, but rather direct pointing signs to the geographic locations that surround them (see chapters 6 and 7). For this reason, a considerable number of pointing signs are directed backward, where signers of other sign languages would be projecting these referents onto the neutral signing space in front of them. For hearing Neapolitans, it has been shown that pointing to the side and to the back plane is often done by using the thumb (Kendon & Versante 2003). Crasborn et al.

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92 This general intensifier was described in detail in section 4.6.

(2006) have suggested that articulatory constraints may play a role in this: it is easier physiologically to point to one's back or side with the thumb. This hypothesis has been corroborated by data from Sign Language of the Netherlands data that show predominantly thumb signs in backwards and sideways pointing (Crasborn et al. 2006). By contrast, in the Kata Kolok corpus the use of thumb pointing has not been observed. There is no evidence that Kata Kolok signers treat backward pointing differently from pointing at other angles. In this way, they parallel speakers of the absolute dominant language Guugu Yimithirr, who also refrain from pointing with the thumb (Levinson 2003:257).

Finally, it should be noted that locative pointing signs may be produced with a tracing movement along the horizon. This tracing movement can be interpreted in three different ways depending on the context: path, area, or duration.

Example 14.2 illustrates the use of a tracing movement to indicate path. The signer is an 8-year-old deaf girl with deaf parents, who is telling a story about a ghost she saw the night before. She discusses how her neighbour, who is said to have supernatural powers, becomes a ghost at night. This ghost went down a path near to the signer's current setting. She uses her non-dominant hand to indicate that path, tracing it along the horizon with her index finger. The pointing sign ends in the use of a non-manual aspectual marker glossed as 'pah' and produced by smacking the lips (see section 4.7.1). While she holds that sign, she produces the sign GHOST with her dominant hand. She then indicates the location where the ghost stopped again by pointing at that location and producing the aspectual marker along with it. The production of the completive aspect marker 'pah' and this final pointing sign is illustrated in Still 14.2. The fact that this pointing sign is produced with the aspectual marker indicates that it is treated as a predicate parallel to other predicative signs that can be marked in a similar way.

Example 14.2 Pointing sign combined with non-manual completeive aspect marker

↓ Still 14.2

NM	<u>pah</u>	<u>pah</u>
MG		GHOST
ND	IX'tracing path'	IX'loc'

'(It) went along that path, the ghost, and then it stopped.'

CGSb14aug7\_IX\_trace\_completive\_aspect.mpg



**Still 14.2** Locative pointing sign produced with completive aspect marker 'pah'

A tracing movement does not necessarily indicate path information, nor is it restricted to locative points. A tracing movement along the horizon can also be used to indicate an area or patch of land given the appropriate context. It also occurs while pointing to the sky, and in these cases too, the movement of a pointing sign can attain multiple meanings, depending on the discourse context. As in Example 14.2 above, a tracing movement along the sky could indicate the path of an object moving through the sky, a hot air balloon for example. Section 14.4.1 describes how a pointing sign that follows the east-west trajectory of the sun is taken to refer to temporal duration in terms of clock hours. These observations

remind us of the significance of discourse context for the interpretation of pointing signs.

#### 14.2.2 Absence of true toponyms

As described in the section above, place reference in Kata Kolok is made by pointing to geographical locations. Strikingly, and potentially in contrast to any other known language, Kata Kolok does not seem to have a class of true toponyms (Zeshan 2006a).<sup>93</sup> That is, in contrast to true toponyms, the Kata Kolok locative constructions *do* provide a spatial instruction on how to find the location provided by the direction of the pointing sign (cf. Levinson 2003:69). A place indication always includes a pointing sign in Kata Kolok, and may include lexical signs, in addition. The referential division of weight between the pointing sign and the lexical sign varies, but the order remains the same: the lexical sign precedes the pointing sign in each case. The utterances and examples described in this section were observed (not filmed) during fieldwork, and have not been attested in the corpus of spontaneous Kata Kolok signing. This suggests that these ‘proto-toponyms’ may be an infrequent spatial structure within the language.

Example 14.3 was produced by one of the deaf women in Bengkulu. I had recently learned that this Kata Kolok signer was not born in Bengkulu, but had actually grown up as a home signer as the single deaf child in a family of nine daughters. She was telling her life story, starting off with the region in which she grew up, before marrying into the village. The signer grew up in Bali’s Kintamani region, which is high up in the Balinese mountains and therefore a comparatively cold region. In response to asking her explicitly in which village she grew up, she refers to her home grounds by the sign for ‘shiver’ followed by a pointing sign up towards Kintamani Mountain. The pointing sign itself is marked in several of the

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93 There is preliminary evidence that Ban Khor Sign Language may be deploying a similar toponym-free locative system (Nonaka 2007).

ways described on p. 362. The lexical sign SHIVER has to be followed by a compulsory pointing sign in order to attract a locative interpretation and cannot refer to a location by itself. In the following conversation she refers to her village several times, and in these instances she uses the pointing sign in isolation.

**Example 14.3 Place indication I**

SHIVER IX'Kintamani'

'Kintamani'

The combination of a lexical sign and a pointing sign in a place indication as described in Example 14.3 occurred in response to *where* questions in both the recorded data and in daily observation. This discourse context makes these locative constructions recognisable as place references rather than person references (see also section 14.3.1). Signers also produce locative constructions in the absence of a *where* question, and in these cases the use of a locative construction rather than just a locative pointing sign seems motivated by the distal indeterminacy illustrated by Figure 12.2 on p. 336. That is, when one aims to indicate a specific location further removed, it becomes harder to be precise by only using a vector. Consider Example 14.4 and Example 14.5 in which the specific locations of Air Sanih and Kubutambahan are indicated respectively. Both villages are close to Bengkala, but are five to 10 kilometres apart. Signers know the area and might go to Air Sanih to visit the public swimming pool, crossing Kubutambahan on their way to Singaraja. A pointing sign by itself would be sufficient to establish a reference to one of these villages. However, in the situation in which Example 14.4 was uttered, the signer was aiming to indicate the specific place where her sister-in-law had worked as a house cleaner and provided an additional phrase describing this location. A pointing sign towards Air Sanih by itself would not have been sufficient to achieve

this goal. She therefore draws on her interlocutors' knowledge of that village and the hotels that are there in order to help them disambiguate the specific location.

Example 14.4 Place indication II  
TOURIST HOUSE IX 'Air Sanih'  
'hotels at Air Sanih'

Example 14.5 was uttered in a story concerning a motorbike accident. In this case, the signer was prompted by the researcher to be specific about the locations and direction of the event, similar to the situation in Example 14.3. The signer establishes reference to a specific crossing in a nearby village (Kubutambahan) by referring to the presence of a large dragon statue there.

Example 14.5 Place indication III  
STATUE IX 'Kubutambahan'  
'the crossing at Kubutambahan with the statue'

Taking into account these two examples of place reference it becomes clear that the lexical part of place constructions need not be redundant with the pointing sign, but rather combines with it to specify the exact location intended. These specifications of pointing signs may arise spontaneously given a communicative need to be more exact when pointing to locations further away from the village. That is, as one is pointing to locations further removed in space, the distal indeterminacy grows. Conversely, pointing to locations within the village is more precise owing to the limited distance between the signer and the target location. Moreover, in nearby locations there may be more shared background knowledge. The examples above have shown that the lexical sign of a place construction specifies the indicated location. The pointing sign in Example 14.4 is direction towards the village of Air Sanih, while the lexical part of the construction narrows

this place indication down to ‘hotels at Air Sanih’. The examples below describe the reverse phenomenon. That is, place constructions in which the lexical sign indicates a location of a type and the pointing sign specifies where that location is. Consider Example 14.6a and b. The sign WAVES by itself cannot be used as a place indication, but can be part of a place construction when it is combined with a pointing sign. It can be combined with a pointing sign directed to any location of the island because it has a general meaning of a place with surface water, for example, the sea or a swimming pool. The pointing signs in these constructions specify which ‘water place’ is intended and this gets a general meaning of ‘water place there’. For instance, when this construction is used with a pointing sign towards Air Sanih, it refers to the public swimming pool of the town (Example 14.6a). When combined with a pointing sign towards Lovina, however, it refers to the beach there (Example 14.6b).

Example 14.6 Place indication IV

a. WAVES IX

‘water there’ / ‘swimming pool at Air Sanih’

b. WAVES IX

‘water there’ / ‘Lovina beach’

Interestingly, the pointing sign in these constructions specifies not only the location of the place, but – by virtue of shared knowledge – also changes the type of ‘water place’ from beach to pool. The interpretation of the pointing sign and the lexical sign are thus interdependent as they form a composite utterance (Enfield 2009).



### *14.3 Indicating people*

Section 7.3 demonstrated that the sign-spatial aspects of Kata Kolok pointing signs indicating people are predominantly motivated by geographic locations. On rare occasions signers also produce pointing signs in the neutral signing space in the absence of the referent, but only when quoting a signed conversation and using the appropriate non-manual markers to indicate role shift (i.e. raised eyebrows, body shift, head tilt, eye gaze aligned with pointing sign).<sup>94</sup> In addition to this, Kata Kolok has developed one truly anaphoric pointing strategy in the form of list buoys (section 7.4).

One of the remaining issues is that, in the absence of referents, Kata Kolok signers also use absolute pointing signs directed at geographic locations and, as a consequence, the language exhibits a structural ambiguity between person and place reference common to other sign languages as well (see the discussion in section 7.2) Section 14.3 addresses the theoretical issues of the grammatical status of pointing with data from Kata Kolok. Section 14.3.1 argues that ambiguity between place and person is resolved on the discourse level. Furthermore, once a geographical location has been indicated in a signed text, this exophoric location can subsequently be used to structure discourse. Section 14.3.2 continues by showing that Kata Kolok distinguishes first person versus non-first person by handshape: the B-hand is used for first person reference, and the index finger for non-first person. Finally, section 14.3.3 presents evidence that grammatical second and third person are not marked systematically with eye gaze in Kata Kolok.

#### **14.3.1 Ambiguity between place indication and person reference**

The canonical way to point out absent non-conversational partners – third persons – in Kata Kolok deviates considerably from other sign languages. That is, Kata Kolok signers do not point in neutral signing space for third person reference, as

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<sup>94</sup> See section 7.5 for details.

was explained on p. 334. When indicating people whom one knows, the pointing sign is directed towards a geographical location frequented by the individual referred to, usually that person's house, work place, or their patch of land.<sup>95</sup> This phenomenon was described in detail in section 7.3. Examples 14.7a and b below show that absolute pointing signs exhibit systematic ambiguity between place indication and person reference. In both cases, the sign MUSLIM is followed by a pointing sign, though directed towards different locations. In Example 14.7a, MUSLIM is followed by a pointing sign towards the island of Java, and refers to the island of Java. In Example 14.7b, MUSLIM is followed by a pointing sign towards Singaraja, and refers to a (deaf) Muslim from this city. Example 14.7a occurred in a narrative in which a signer discusses Indonesian politics. The signer opines that the Balinese, as a Hindu minority within a predominantly Muslim country, sometimes feel disadvantaged on a national level. Subsequent points towards Java within this narrative are interpreted as 'the government in Java/Jakarta'. Kata Kolok does not have lexicalised or other conventionalised means to indicate the national authorities. Nevertheless, this example shows that signers are able to discuss topics at a relatively abstract level using absolute pointing. Example 14.7b was produced by the same signer who was asked to tell the story of his son's death in a motorbike accident. In the events leading up to his son's death, his son befriended a Muslim from Singaraja. The night that his son died both of them had got drunk and his son drove back to Singaraja under the influence of alcohol when he got hit by a truck. Without the context of this story 'MUSLIM IX Singaraja' could be a place indication, for example meaning 'the mosque in Singaraja,' but it actually means '(the) Muslim (from) Singaraja'. This

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<sup>95</sup> Levinson (2007) reports that in Yéli Dnye co-speech gestures, individuals are conventionally indicated by pointing at their home base. In the case of Kata Kolok, however, there appears to be variation: absolute pointing signs indicating individuals vary, possibly related to the way the referent is framed within the specific narrative.

contrastive pair shows that the discourse context in which a construction is produced is crucial in the disambiguation between place and person reference in Kata Kolok.

Example 14.7 Place versus person reference

a. MUSLIM IX

‘Muslim there’ / ‘the government in Java/Jakarta’

b. MUSLIM IX

‘Muslim there’ / ‘(the) Muslim (from) Singaraja’

*Discourse functions of absolute pointing*

The locations indicated in these constructions are subsequently used to construct spatial discourse. In Example 14.8, below, a signer discusses a Muslim person from Java by using the lexical sign for Muslim followed by an index finger point in the direction of Java. While pointing at the island, the signer uses several markers to indicate that it involves a distant location: raised upper arm, vertical elevation, straight movement, upward fingertip orientation, and pursed lips (pl). In addition, the signer uses squinted eyes (sq) simultaneously with the pointing sign. The use of squinted eyes is a way of checking familiarity of the location with one’s interlocutor. This could be a ‘try marker’, as the signer is checking the interlocutor’s familiarity with the indicated location (Moerman 1988; Engberg-Pedersen 1990; Enfield 2009:108-109). The use of squinted eyes is not restricted to index finger pointing in Kata Kolok (section 4.6). Following the use of the index finger points for Java, the sign COME-HERE-FROM-A is produced conforming to the geographic location of Java. Section 6.5 described the sign-spatial modification of general directional verbs in Kata Kolok in detail.

Example 14.8 Pointing sign with try marker

NM pl + sq pl + sq  
MG IX'Java' MUSLIM IX'Java' COME-HERE-FROM-A'Java'  
ND

'The Muslim from there (Java) came here.'

Gta6oct7\_try\_marker.mpg

*Limitations of absolute pointing*

While pointing signs that indicate individuals are predominantly directed to the neutral signing space in other sign languages, Kata Kolok signers prefer to direct pointing for third person towards geographic locations. These locations can subsequently be used to anaphorically refer to individuals that are associated with that location, similarly to the referential loci described for other sign languages (see section 1.4.2). Unlike the loci that are established in the neutral signing space however, Kata Kolok's geographic locations are not used to place nouns or even whole propositions at that locus to associate them with the presupposed referent. They are also not used to spatially direct agreement verbs to indicate core arguments of a transitive clause (see section 4.8; Zeshan, Marsaja, & de Vos in prep.). Alternative deictic strategies that achieve a similar function have been addressed in Part III of the thesis.

14.3.2 The grammatical category of first person

While reference to first person normally involves a pointing sign directed towards ego in sign languages, the place of articulation and the type of articulator differ cross-linguistically. In Kata Kolok, first person reference is made with the B-hand. In Sign Language of the Netherlands, as in many other sign languages, first person reference is made with the index finger at the chest. In Japanese Sign Language, first person reference is made by an index finger point located at the chest or at the nose, as can also be the case in Japanese co-speech gesture. This is illustrated in

the examples in Figure 14.1 below (Yoneyama Akihiko 1997).<sup>96</sup> These cross-linguistic differences show that pointing towards self not only draws on sign-spatiality but also on conventions that are specific to a particular community.



**Figure 14.1** Two forms of first person reference in Japanese Sign Language

The place of articulation in Kata Kolok, the chest, is consistent across first person references: first person pointing signs are never directed at another body part. Pointing to self refers to grammatical first person and not just to the current signer because reference can shift to one of the characters in a story, first person reference can also become transposed in quoted ‘speech’ when using role shift. It becomes similar to an English utterance such as: ‘and then he said: “*I* don’t want to do that.”’ First person indications in Kata Kolok thus parallels spoken language pronouns in all relevant ways.

Notably, both Kata Kolok and Japanese Sign Language allow for variants that involve an index finger point towards the chest, which is identical to the form for first person reference in Sign Language of the Netherlands. According to Marsaja (2008:177) the index finger point is more frequent than the B-hand, but in the

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<sup>96</sup> I would like to thank my colleague Keiko Sagara for modelling these Japanese Sign Language examples, and Mike Morgan for help in finding the dictionary reference.

current data set, only 2 out of 282 instances of first person indications were produced with the index finger. These figures are compatible with Perniss & Zeshan's observations that, in Kata Kolok, first person reference is made by an index finger point infrequently (2008:131). The formal marking by a B-hand rather than an index finger supports the existence of a grammatical first-person category in Kata Kolok that is independent of its sign-spatial properties.

What drives the preference for first person reference with the B-hand rather than the index finger? One of the index finger instances in the current analysis concerns the indication of YOU-AND-ME, here the use of the index finger is presumably a phonological assimilation to the following sign, which uses an index finger to indicate the addressee. Another 'counter example' has been found in the indication of sunset. While this pointing sign was directed at the signer's own chest it did not touch the chest, and it was also produced with a bent index finger. This instance shows that Kata Kolok signers can point 'through their bodies' to locations behind them. The phenomenon of pointing 'through the self' has also been reported for the absolute pointing gestures of Guugu Yimithirr speakers (Levinson 2003:256). This latter observation suggests that the use of the B-hand rather than an index finger may thus be used to disambiguate between the indication of self and a location behind self.<sup>97</sup>

First person indications also occur in a reduplicated form in Kata Kolok. This repetition can have two functions, which can only be differentiated by discourse context. Firstly, the repeated form is used in response to information requests, for example, when one answers questions such as, "whose are these flip-flops?" or "who is joining us for an afternoon swim in the river?" In these contexts, the movement repetition is compulsory and appears to mark focus, that is, new

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97 Pointing through body parts may not be as exotic as it seems; in a number of cultures people point out individuals 'through' their hands in order to prevent that individual from noticing this inappropriate behaviour.

information. The second context in which the repetition of first person indication occurs is as an interjection; this sign functions to express empathy, for instance when one sees a small child fall off his/her bicycle.

#### 14.3.3 Eye-gaze and the grammatical category of person

For other sign languages, second versus third person distinction has sometimes been hypothesised to be marked by different eye gaze patterns (Berenz 2002 on Brazilian Sign Language). Specifically, while pointing signs towards addressees (second person) reportedly coincide with eye gaze at the addressee, the gaze direction accompanying pointing signs directed towards non-conversation partners has been reported to follow the vector of the pointing sign. By contrast, Meier (1990:186-7) hypothesised that eye contact is an important function of signed conversations in general, and therefore an unreliable cue to the grammatical person of pointing signs in American Sign Language. Eye gaze patterns associated with Kata Kolok pointing signs that indicate individuals challenge both generalisations: eye gaze does not mark grammatical person in Kata Kolok, nor is eye contact maintained for the entire duration of signed conversations.

Table 13.2 presented an overview of the data that were analysed for the purposes of this study, and the files that were coded in detail were indicated by bold script. Each of the pointing signs in this subset have been coded according to whether eye gaze was aligned with the pointing sign (+e), directed at the addressee (+ea), or in another direction (-e). For the current analysis, pointing signs for which the eye gaze pattern could not be determined are left out, resulting in 202 first person references, 110 second person references and 97 third person references. In this data set no list buoys occurred. Table 14.1 presents the percentages of eye gaze patterns. During the indication of first person, eye gaze is either directed at the addressee (44%), or in another direction (56%), but never at their own chest. In the indication of the addressee, eye gaze is directed at the addressee in 81% of cases; in the remaining instances the eye gaze is neither directed at self, nor at the

addressee. By contrast, in third person reference, eye gaze is rarely (14%) directed at the addressee of the utterance. Instead, the eye gaze is aligned with the pointing sign in 80% of instances.

EYE GAZE PATTERN	THIRD PERSON	SECOND PERSON	FIRST PERSON
Eye gaze not at addressee nor aligned with pointing sign (-e)	6 (6%)	21 (19%)	113 (56%)
Eye gaze at addressee (+ea)	14 (14%)	89 (81%)	89 (44%)
Eye gaze aligned with pointing sign (+e)	77 (80%)	-	-
	97 (100%)	110 (100%)	202 (100%)

**Table 14.1** Eye gaze patterns with pronominal pointing signs  
(percentages in brackets give the relative frequencies of eye gaze patterns with each type of pronominal pointing sign)

These patterns show that there is a strong tendency for eye gaze to be aligned with the pointing sign for both second and third person pointing signs. They also show that there is a considerable amount of variability in eye gaze patterns and that eye gaze may be an unreliable cue in determining the grammatical person category of a pointing sign.<sup>98</sup> Interestingly, section 7.4 indicated that Kata Kolok might differentiate between second and third person, but in a different way. Specifically, it was suggested that Kata Kolok signers produce list buoys to refer to third person referents, but not to addressees. Further research is needed to assess whether Kata Kolok marks the grammatical distinction between second and third person further.

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<sup>98</sup> Recent analyses of spontaneous conversations of American Sign Language (Lillo-Martin & Meier 2011) and Australian Sign Language (Johnston 2010a) reveal further variation in gaze patterns between sign languages.

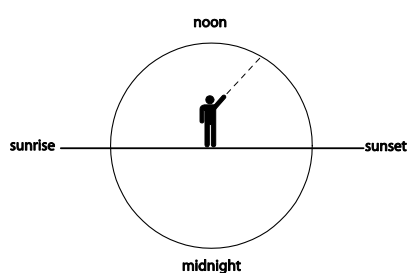


#### 14.4 Indicating time

This section explores the workings of the celestial timeline, which was touched upon briefly in section 8.3 of the thesis. Section 14.4.1 identifies three constructions in which celestial pointing signs that indicate temporal information occur: non-redundant celestial pointing, constructions with the lexical sign TIME and the cardinal number, and constructions with either the lexical sign TIME or a cardinal number. Based on a discussion of non-redundant temporal pointing signs, in particular, section 14.4.2 argues that discourse context, constructional slot, and formal characteristics cue the specific meanings of celestial pointing signs.

##### 14.4.1 Celestial pointing

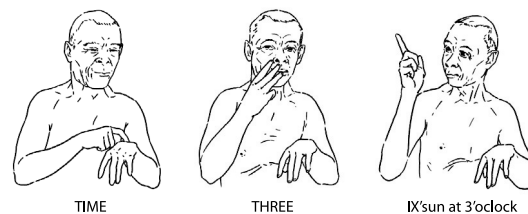
While Kata Kolok does not deploy a body-anchored timeline (see sections 1.4.3 and 8.3), it is the first reported case of a sign language to deploy a celestial timeline. Figure 14.2 illustrates the concept of this celestial timeline diagrammatically. The black symbol represents a signer pointing towards the sky to indicate time by directing the point towards the locations of the sun at the time of day along the *kangin/kauh* axis. Since Bali is close to the equator, sunrise is approximately at 6 a.m. and sunset at 6 p.m., without any large differences year-round. A pointing sign upward refers to noon, while the other times of day and night are presumably less exact and this issue is addressed on p. 384.



**Figure 14.2** Diagram of the absolute celestial timeline

The celestial timeline is fully operative for referring to the time of the day, even when inside a building, and in this case the celestial time line has also been extended to refer to night-time (see p. 385). There are three ways in which these celestial pointing signs are used: as an extended construction with the lexical sign TIME and the cardinal number, as a construction with either the lexical sign TIME or as a cardinal number, and a celestial pointing sign without either of these lexical signs. These latter type of time indications will be referred to as non-redundant celestial pointing signs.

The extended construction that indicates the time of day combines the signs TIME (an index finger touching the wrist) and a lexical cardinal number followed by a pointing sign directed towards the usual position of the sun at that time of the day. In these cases, the pointing sign thus provides some redundant information. Figure 14.3 exemplifies such a construction using stills. This construction is only used to refer to the times that fall in daylight hours, and not for times after 6 p.m.



**Figure 14.3** Extended celestial pointing construction

Some time indications exclude the celestial pointing sign altogether. Example 14.9 illustrates such an instance.<sup>99</sup>

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<sup>99</sup> The sign RECENT-TIME has a symmetrical temporal meaning similar to the sign PIDAN which refers to events in the distant past or distant future (see section 8.4.2 for a

Example 14.9 5 a.m.

NM

MG RECENT-TIME TIME 5 GO-FROM-HERE-TO-B WANT EAT PACKAGE-MEAT

ND

‘At 5 (a.m. I) leave (for work, and) want my meal packed.’

SuJu16jan7\_5am.mpg

Kata Kolok uses a 12-hour clock system, which makes each of these cardinal numbers potentially ambiguous. However, given the fact that 5 a.m. is a normal time to leave for work in the Balinese context, while 5 p.m. is not, there is no confusion in this case. This kind of disambiguation is presumably not very different from other languages. Thus, it seems natural for me to say in Dutch, *Ik ga om 8 uur naar mijn werk* – ‘I am leaving for work at 8,’ implying 8 a.m., when I am speaking to someone who is familiar with my work schedule. When signers need to disambiguate this construction, they can do so by using the lexical sign DARK directly following the cardinal number. Alternatively, they can use the extended celestial pointing construction.

Pointing towards the sun can also function as a time indication in itself, without reference to cardinal numbers. Still 14.10 presents such a non-redundant celestial pointing sign, stemming from the utterance in Example 14.10.

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detailed discussion of PIDAN). RECENT-TIME refers to events which directly preceded or follow the timing of a Narrated Event.



**Still 14.10** Non-redundant celestial pointing sign

Example 14.10 Non-redundant celestial pointing sign

*Still 14.10*

NM

MG IX'sun at ~4 p.m.' FIRE-WOOD DROP COOK IX'kitchen' COOK

ND

'Late in the afternoon, (she usually comes in and) puts the firewood in the kitchen for cooking.'

KK-inthehutDn1\_non-redundant\_celestial\_point.mpg

The pointing sign in Example 14.10 is glossed as indicating approximately 4 p.m. The reason for adding the approximation mark is that when a celestial pointing sign indicates time in the absence of a cardinal number, it probably does not convey the same accuracy as the full construction does.<sup>100</sup> Fieldwork experiences have taught me that when a non-redundant celestial pointing sign functions to agree a meeting time at, say, 4 p.m., it is unlikely that a signer would be upset if his friend arrived at 4:45pm. This casual use of pointing

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<sup>100</sup> This analysis is at odds with Marsaja (2008:166) who assigns categorical distinctions to celestial pointing signs every 15°, i.e. 75° east = 11 a.m., 90° up = noon, and 105° west = 1 p.m.).

for time without making explicit reference to the exact clock hour may be related to Balinese culture in general.<sup>101</sup> In other words, people need not be specific as there rarely is a social sanction for being ‘late’. Section 14.4.2 addresses the question of how these non-redundant celestial pointing signs are resolved in context.

### *Sunrise and sunset*

In addition to the celestial pointing that indicates temporal information during the day, Kata Kolok signers also deploy a bent index finger point to indicate sunrise and sunset, produced in the eastern and western parts of the signing space respectively. Example 14.11 illustrates a pointing sign that indicates sunrise. At the time of this recording, the camera was positioned south of the signing dyad. As becomes clear from the video, the movement of the pointing sign starts high in the signing space, level with the signer’s forehead before tracing down toward the eastern corner of the signer’s signing space. Still 14.11 presents an image of the final position of this pointing sign.



**Still 14.11** Temporal pointing sign ‘before sunrise’

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101 Celestial pointing is also used to indicate times of day in Balinese co-speech gesture. The phenomenon has also been reported for the co-speech gestures in other communities in the Americas and Australia (see, for example, Levinson 2003:262; Floyd 2010).

Example 14.11 IX‘before sunrise’

↓ Still 14.11

NM			<u>nod + +</u>		<u>nod + +</u>
MG	COOK	IX‘before sunrise’	COOK	FEMALE	COOK
ND					

‘My mother always cooks for me before sunrise.’

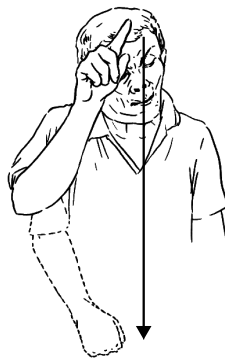
SuJu16jan7\_before\_sunrise.mpg

Unlike the pointing signs for other times of day, the pointing signs for sunrise and sunset are produced with a bent index finger and downward movement. The bent index finger marks the location of the sun below the horizon. The downward movement is intriguing in that it does *not* follow the sun’s natural trajectory during the day, but rather seems to emphasise the fact that the sun’s position is at a lower elevation than the present scene, by adding downward movement. As reported in section 14.2, bent index finger points can also indicate locations at a lower elevation. Bent index finger points produced in the eastern or western - but not the southern or northern - corner of signing space can therefore result in ambiguity when the lexical construction with TIME and/or a cardinal number are not used. Example 14.11, outside the present discourse context, could thus mean ‘my mother always cooks for me there (at a lower elevation).’

*Night-time and day-time*

As mentioned above, several communities are attested to have adopted a system of celestial pointing signs to indicate temporal information (e.g. Levinson 2003:262; Gaby 2009; Floyd 2010). In the case of Kata Kolok this celestial pointing system has been extended to refer to times during the night. Example 14.12 presents an utterance that was recorded with the camera west of the signer. The signer produces a pointing sign with a bent index finger and an arched tracing movement downward starting from midday and down into signing space, arcing toward the

signer, until stopped by the restriction of his own body. Still 14.12 displays the initial and final frame of the pointing sign combined into a single image.<sup>102</sup> Notably, this was the only example of a reference to midnight in the annotated corpus, although this type of pointing sign has been observed during fieldwork as well. The relative infrequency in the annotated data set suggests that pointing signs that indicate times after dark are less frequent than celestial pointing signs that indicate times during the day.



**Still 14.12** Midnight

Example 14.12 IX 'midnight' (part 1)

NM 'pah'

MG MORNING + + GOOD IX '2pm' SUN

ND

'The morning would have been good, or midday, when the sun is up.'

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<sup>102</sup> Marsaja (2008) does not report on the use of this pointing sign.

Example 14.2 IX‘midnight’(part 2)

↓ Still 14.12

NM

MG **IX‘midnight’** SEARCH MEET NEG

ND

‘But during the night he could not see who he would run into.’

DN26sep7\_midnight.mpg

Interestingly, the sign-spatial movement of this pointing sign is suggestive of a supposed trajectory of the sun underneath the earth. This type of conceptualisation matches Balinese cosmoslogy where the sun goes under the disc-shaped world on a giant turtle which floats on an endless sea (Covarrubias 1950:6-7). When I asked signers about their cosmic world views, they indicated however that they are aware that it is actually the earth that circles the sun and that it spins around its own axis. Although the form of these pointing signs still adheres to the East-West trajectory of the sun, this sign-spatial movement may thus no longer be interpreted in absolute terms.

*Duration*

The tracing movement of IX‘midnight’ in the example above does not indicate duration. In Kata Kolok, this kind of arc-shaped movement can however be used to indicate the duration of events during the daytime, and in this case, the pointing signs also follow the trajectory of the sun from east to west but with a neutral, not bent, index finger. This is illustrated by Still 14.3, which stems from the utterance in Example 14.13 below. Kata Kolok does not have a dedicated lexical construction with cardinal numbers to indicate the duration of events.



Example 14.13 IX'all day'

↓ Still 14.13

NM

MG IX'12 o'clock' RECENT-TIME IX'all day' SIX TEN-THOUSAND SIX

ND

'When (the motorbike is picked up) at 12 o'clock, it costs 60,000 Rupiah for the whole day.'

ReKe10jan7\_all\_day.mpg



**Still 14.3** All day

#### 14.4.2 Cues for celestial pointing

As we have seen above, celestial pointing signs may be used non-redundantly as the sole indicators of time independent of other signs. In such cases, these pointing signs are potentially ambiguous between an adverbial expression of time or location. How do signers know how when a pointing sign is to be interpreted as a time indication? Are there any formal cues that prompt this particular function within the sentence? It was previously hypothesised that temporal pointing in Kata Kolok is marked by the use of eye gaze aligned with the pointing sign (de Vos 2008). With the advantage of having a large corpus of annotated pointing signs the

validity of this hypothesis can now be tested. Celestial pointing signs are produced with aligned eye gaze in 70% of the cases. By contrast, aligned eye gaze occurs in 43% of pointing signs that neither indicate time nor first person (see Table 14.2). Although aligned eye gaze is thus more frequent in celestial pointing signs than in all other pointing signs, it does not distinguish temporal pointing from other pointing signs in every case.

EYE GAZE PATTERN	CELESTIAL POINTS	OTHER POINTS
Eye gaze not at addressee nor aligned with pointing sign (-e)	5 (10%)	119 (21%)
Eye gaze at addressee (+ea)	10 (20%)	209 (36%)
Eye gaze aligned with pointing sign (+e%)	35 (70%)	249 (43%)
TOTAL	50 (100%)	577 (100%)

**Table 14.2** Eye gaze patterns in celestial pointing versus other pointing signs (percentages in brackets give the relative frequencies of eye gaze patterns in celestial pointing and other pointing signs)

So, eye gaze is clearly not a reliable cue for the identification of a pointing sign as a time indication. But, how frequently does this kind of ambiguity occur, allowing for disambiguation in actual discourse contexts? In order to address this question, the pointing signs analysed as time indications were reviewed a second time and grouped into three constructions: non-redundant celestial pointing, constructions with the lexical sign *TIME* *and* the cardinal number, and constructions with *either* the lexical sign *TIME* *or* a cardinal number.

Table 14.3 displays the frequencies of each of these constructions. Non-redundant celestial pointing is most frequent (32 instances), followed by constructions with *TIME* and the cardinal number (16 instances), and constructions

with either the lexical sign TIME or the cardinal number (the least frequent, with 5 instances).

TEMPORAL POINTING CONSTRUCTION	NO. OF OCCURENCES	%
non-redundant celestial pointing	32	(60.4)
constructions with TIME <i>and</i> cardinal number	16	(30.2)
constructions with <i>either</i> TIME <i>or</i> cardinal number	5	(9.4)
TOTAL	53	(100)

**Table 14.3** Frequencies of temporal pointing constructions  
(figures in brackets are percentages of the total number of temporal pointing constructions)

As becomes clear from Table 14.3, 39.6% of the celestial pointing signs occur in a construction with the lexical sign for TIME and/or the cardinal number. Such lexical cues are a strong disambiguating factor in their interpretation. However, 60.4% of the celestial pointing signs are potentially ambiguous given their lack of immediate lexical context. Nine out of all non-redundant pointing signs did not have aligned eye gaze. The overall frequency of aligned eye gaze in non-redundant celestial pointing signs was thus 71.8%, which is very close to the proportion of eye gaze in all celestial pointing signs, and eye gaze does therefore not fully determine the interpretation of a celestial pointing sign as a time indication. 10 out of 32 of the non-redundant celestial pointing signs are used to indicate duration and thus have a tracing movement along the east-west axis. As was discussed on p. 367, locative pointing signs can attain vertical movement, and for this reason, the use of the east-west axis for tracing movement does not uniquely identify a time indication. A vertical tracing movement across the east-west axis can thus indicate any referent that follows this trajectory.

Two such non-temporal instances of pointing signs tracing the sky were found: a reference to God and a reference to the colour blue. In the first case, the signer was talking about praying and the preceding discourse thus prompted the

interpretation of this pointing sign. In the second case, a signer was asked to describe colours in a structured elicitation setting, and the pointing sign was preceded by the lexical sign PAINT. The interpretation of non-redundant celestial pointing signs as time indications is often prompted by the discourse context. Example 14.14 illustrates this with a small stretch of discourse in which the narrator describes his daily routine. It thus seems that the discourse context, i.e. the fact that the signer is talking about his daily routine, cues its interpretation as a temporal pointing sign. In other words, these pointing signs could have been interpreted as locative constructions indicating the locations of these activities. No formal cues that uniquely identify these celestial pointing signs as time indications have been found, and their resolution thus relies entirely on the discourse context.

Example 14.14 Non-redundant celestial points and context

NM

MG IX'1 p.m.' FINISH COME-HERE-FROM-A'from house in the village' ME + +

ND

'After 1 p.m. I come here (from my house in the village), oh my.'

NM

MG FINISH SLEEP FINISH IX'2 p.m.' CUT-GRASS IX '6 p.m.' PRAY

ND

'After I have slept for an hour, I cut grass. At 6 in the evening I pray.'

Dna26sep7\_non-redundant\_celestial\_point2.mpg

*14.5 Lexicalised pointing*

This final section of chapter 14 presents two additional functions of Kata Kolok pointing signs that had previously not been reported: pointing to indicate body parts, and pointing for colour. The data on Kata Kolok colour indications in

particular suggest that while some pointing signs are dependent on a constructional slot, other pointing signs have attained conventionalised meanings, independent of context, and have thus become fully lexicalised.

#### 14.5.1 Body parts

In Kata Kolok, body parts are indicated by pointing at them; such pointing signs may or may not make contact with the body. In cases where a signer points at his own body, the sign can refer to either his own body part or to that body part in general. By contrast, when a signer points at someone else's body part it can only refer to the particular body part of that person (see also Berenz 2002:25 on Brazilian Sign Language). In Example 14.15 below, a signer produces a pointing sign at the cheek, but the sign nevertheless refers to the eye. The pointing sign in Example 14.15 refers to the signer's own eye, but in other contexts the same pointing sign can refer to the eyes in general. In certain contexts, the same sign can also mean 'see,' 'look,' or 'watch'.

##### Example 14.15 Pointing to body parts: EYE (part 1)

Signer 1 (on the left)

NM

MG PALE-FACE IX'you' SIGN-NAME'MS' PALE-FACE

ND

'Your face is pale and you are thin. And so is MS.'

Signer 2 (on the right)

NM nod

MG BAD SIGN-NAME'MS' TALK-BADLY GET-HIT B:i IX'eye'

ND

'MS is evil. She is loud-mouthed. She hit me once...

Example 14.15 Pointing to body parts: EYE (part 2)

NM

MG GET-HIT LUMP IX‘eye’

ND

... and gave me a swollen eye.’

ReKe10jan7\_EYE.mpg

Pyers (2006) reports systematic variation in the forms of hand shapes that are used in body part indication for American Sign Language. More research on Kata Kolok body part indication is needed to show if such regularities exist in Kata Kolok as well. Cross-linguistic research on body part terminology in spoken languages has revealed differences between the semantic extensions of these words even between individuals (Enfield, Majid, & van Staden 2006). Given the fact that sign languages point at body parts to indicate them, a similar investigation would be of interest.

#### 14.5.2 Pointing for colour

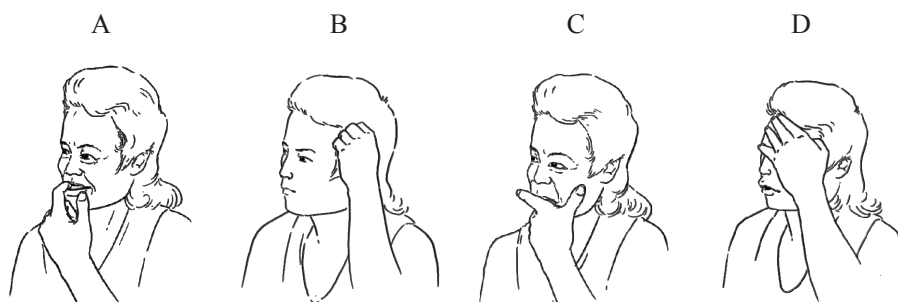
As discussed in section 4.3, Kata Kolok has four conventionalised signs to talk about black, white, red, and colours covering the blue-green domain.<sup>103</sup> In addition to these lexical colour signs, signers may also use pointing to indicate colour. The signs used for ‘black’ and ‘white’ are metonymic extensions of the lexical signs HAIR and TEETH. HAIR is formed by taking hold of a piece of one’s own hair. Since all Balinese have black hair, this is an iconic way of referring to the colour black.<sup>104</sup> Interestingly, the exact same gesture means BLOND in British Sign

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103 Description of the colour term system of Kata Kolok is based on corpus research as well as the results of controlled elicitation using a standardised set of 80 colour chips (Majid & Levinson 2007).

104 During the elicitation sessions that focused on colour terms, some signers would find the fact that I have red hair hilarious, but this did not lead to any confusion regarding the

Language (Brien 1992). The sign TEETH is produced by touching one's teeth twice with the nail of the index finger. In addition to its semantic extension as a colour sign, the sign can also refer to *tuak*, 'palm wine,' which is a cloudy, white alcoholic drink. The sign RED is produced by touching one's lips with the full index finger by a sweeping movement using the L-hand shape. Unlike the lexical signs HAIR and TEETH, the primary meaning of the sign for RED is not 'lips' and therefore is not glossed as such. To indicate LIP one needs to indicate these appropriately by touching the lip with the top of the index finger and an X-hand shape. The sign RED can be extended semantically to refer to a 100,000 Rupiah note, which is red in colour. Finally, there is one lexical sign in Kata Kolok that is used solely as a colour term - the sign GRUE, covering both English 'green' and 'blue'. The four colour signs are illustrated in Figure 14.4 below.



**Figure 14.4** Kata Kolok's four lexical colour signs  
(WHITE (panel A), BLACK (panel B), RED (panel C), and GRUE (panel D))

In addition to these conventional signs, Kata Kolok signers also use two alternative strategies to talk about colour. First of all, signers may refer to a colour by referring to objects that stereotypically have that colour. For instance, a signer may

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meaning that I intended to convey. In my view, this is another indication of the conventionalised meaning of this sign.

use the lexical sign for BANANA or TURMERIC to refer to the yellow colour. The primary meaning of these signs is nominal, and signers show a lot of variation in the kinds of objects they use to refer to identical colours (de Vos 2011). Secondly, in the naturalistic data, Kata Kolok signers often point at an object in the vicinity to either substitute or specify a lexical colour sign. This pointing may also take the form of touching an object. In some cases, signers manipulate a piece of clothing, for example their *sarong* to present a colour. In Example 14.16 below, pointing for colour is illustrated by an example taken from a narrative about a deaf ghost the signer has met at the village cemetery.

Example 14.16 Pointing as colour description (part 1)

NM

MG GHOST HAIR SAME

ND [searching behaviour]

‘The ghost had hair like...

Example 14.16 Pointing as colour description (part 2)

NM

MG **IX‘at M’s trousers’** BODY-COVERED#intens SAME + + + #intens

ND

... M's trousers (black in colour), all over his body.’

Gta6oct7\_pointingforcolour.mpg

The example above is typical of the behaviour that cues an index finger point’s interpretation as a colour description. That is, the pointing sign is preceded by ostensive searching behaviour, i.e. the signer moves and acts as if actively searching for a colour. This active searching behaviour also happens in subsequent points to the same object in the same location within an experimental setting. In other words, this type of searching behaviour is displayed even when it does not seem required from the signer’s own perspective. The use of ostensive searching



behaviour thus seems to have become indicative of colour descriptions. As an alternative to the use of ostensive searching behaviour, some signers also used the lexical sign PAINT before pointing to an object. This lexical sign is made by a B-hand that makes a painting movement either on a flat base hand or in the air as if painting a wall. To conclude, there are strong constructional cues to the interpretation of a pointing sign as a colour indication: either ostensive searching behaviour, or the lexical sign PAINT.

#### 14.5.3 Lexicalisation of pointing signs

Kata Kolok's colour system sheds light on the lexicalization processes that pointing signs may undergo. Consider tapping on the teeth versus pointing towards an object in the vicinity to indicate a colour. There are two notable differences in their use that disclose their lexical status. First of all, while pointing to an object in the vicinity needs to be preceded by the lexical sign PAINT or by ostensive searching behaviour, the sign for TEETH does not. This suggests that the pointing sign has received a stable interpretation as a colour indicator. Interestingly, this stable meaning has resulted in a metonymic extension to indicate a white, local wine as well. Similarly, the lexicalised pointing sign indicating an eye has acquired the predicative meaning 'see'. Secondly, the pointing sign directed at the teeth can be used with the morphological and non-manual markers of intensification like the other lexical signs HAIR, RED and GRUE (see also section 4.6.1). Contrastingly, the *ad hoc* pointing signs directed at an object cannot be integrated into the morphosyntax of the language in this way. Both patterns suggest that tapping on the teeth is lexicalised while pointing at other objects is not. I would like to argue that it is no coincidence that pointing signs directed at the body are lexicalised and the other pointing signs are not. The body provides a springboard from which pointing signs may become lexicalised as they consequently take the same form. That is, while the meaning of pointing signs is usually highly context-dependent,

the body forms an ever-present anchor point, which allows the conventionalisation of indexical signs based on a stable sign-spatial form.

#### *14.6 Summary and discussion*

In the preceding chapters, it has become clear that the meanings of Kata Kolok pointing signs show similar referential ambiguities to those seen with pointing gestures and pointing signs in other sign languages. It is also evident that Kata Kolok has developed regularised form-meaning mappings: stable sign-spatial forms, constructional slots, and other formal properties such as non-manual markers that have become indicative of the meaning of a pointing sign. Individual pointing signs vary in the degree to which they are context-dependent, whether or not they are marked formally, and what particular function they fulfil. This general finding suggests that when considering the syntactic integration of pointing signs, one needs to differentiate between pointing signs on the basis of the cues that lead to their full interpretations. This issue is addressed in the next chapter.

## 15 *The semiotic ecologies of pointing*

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### 15.1 *Overview*

Section 15.2 summarises the main findings and remaining questions regarding the Kata Kolok pointing system. Based on these generalisations, section 15.3 proposes an incremental model of how the meanings of specific types of Kata Kolok pointing signs are constructed as various cues become available in the discourse. Section 15.4 argues that the Kata Kolok pointing system as a whole shows various grammatical aspects: language-specific forms that mark linguistic strategies, syntactic integration on a par with other (lexical) signs, and grammatical rules of usage. When looking at the full spectrum of pointing signs in Kata Kolok, however, it appears that different types of pointing signs may be morphemised and syntactically integrated into the language to varying degrees (section 15.5). Section 15.6 explores the usefulness of applying identical classifications to pointing gestures, and subsequently identifies additional parameters of variation for comparing pointing gestures and pointing signs *in situ*. The research methodology and criteria that are proposed in these sections could be adopted for other signing and speech communities, too. This would allow us to address the similarities and differences between pointing in varying semiotic ecologies as suggested by Kendon (2008). Ultimately, such investigations could lead to a more comprehensive understanding of pointing phenomena and their roles in co-speech gesture and sign language.

### 15.2 *Main findings regarding the Kata Kolok pointing system*

One major finding has been that Kata Kolok pointing signs are systematically combined with grammatical non-manual markers that are not restricted to pointing signs. For instance, the use of the general intensifier with a pointing sign marks distance in locative demonstratives. The use of squinted eyes with pointing signs

and non-pointing signs alike is used as a ‘try marker’ to check whether the interlocutor is familiar with the referent that has been indicated. Those pointing signs that provide path information through a tracing movement can co-occur with the non-manual negative completive aspect marker (a protruded tongue) and with the non-manual completive aspect marker (a lip smack glossed as ‘pah’). Both non-manual aspectual markers are also used for other predicates. Since all of these non-manual markers are used with lexical signs, we may consider them evidence for the syntactic integration of pointing signs in Kata Kolok. That is, since pointing signs are marked similarly to other manual signs, these instantiations of pointing signs are treated as being members of the same word class as these manual signs.

The data also support the observation that the forms of pointing signs are in part determined by the nature of the referent. For instance, the distinction between first and non-first person is marked by the use of the whole hand rather than the index finger. A bent index finger is used for locations at a lower elevation. Distance is marked in multiple ways, including the use of upward fingertip orientation and a projecting movement in the direction of the location (see p. 363 for more detail). Large parts of the Kata Kolok pointing system are highly regularised and formally marked in these ways. However, some impressionistic patterns were not corroborated by frequency analysis of the corpus. Eye gaze patterns, for instance, are an unreliable cue to the function of a pointing sign. The use of a large corpus of formally and functionally annotated pointing signs has proven vital in addressing these systematic form-meaning mappings.

Despite the fact that Kata Kolok pointing signs are marked formally in many ways, the system also exhibits structural ambiguities that require resolution on a discourse level. Both place indications and person reference involve pointing to geographic locations and are not formally distinguished otherwise. Tracing along the horizon can indicate path information or a patch of land. An upward tracing movement across the east-west axis can indicate duration in terms of clock hours,

or the trajectory of an object moving along the sky. By using spontaneous, contextualised data this study was able to assess how interlocutors come to a full understanding of these pointing signs. For third person reference, for instance, the pointing sign is often preceded by the use of an individual's sign name. Similarly, celestial pointing is often preceded by the lexical sign TIME and by a cardinal number. Pointing for colour is preceded by either extensive searching behaviour, or the lexical sign PAINT, without exception. While all pointing signs are embedded into a wider discourse, the meanings of these three types of pointing signs arise from the specific sentential slot they fill.

The frequency of each pointing type differs naturally in the spontaneous data set (see Table 13.3 on p. 359), and the generalisations regarding the Kata Kolok pointing system vary in reliability as a result. This is true in particular for those pointing signs that were not included in the major categories that indicate people, locations, and time. Pointing signs that indicate colours, for instance, occurred only five times in 1,183 annotated pointing signs of the spontaneous Kata Kolok discourse. However, both lexical and non-lexical pointing signs were attested in nine additional signers in their descriptions of a standardised stimulus kit of 80 colour chips from the Munsell colour chart (de Vos 2011). Similarly, the anaphoric use of list-buoys occurred only once in the corpus of spontaneous Kata Kolok signing, but this structure has been observed multiple times during fieldwork activities, and have been successfully elicited using videos of reciprocal events in four additional signers (section 7.4; Evans et al. 2004). Hence, while certain sub-types of pointing signs are rare, these observations suggest that specific types of pointing signs could be systematically elicited to substantiate the findings from the corpus analysis.

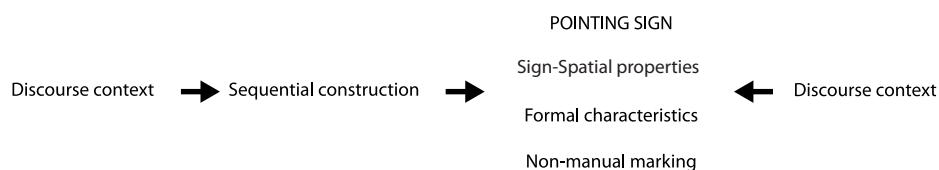
The systematicities that have been attested in the Kata Kolok pointing system appear to have resulted from a process of conventionalisation. There are however two reasons why this conclusion may be premature. First, very little information is

available concerning the Balinese co-speech gesture system, and it is therefore possible that the observed patterns in part predate the integration of pointing signs into Kata Kolok (but see Dasen & Mishra 2010 on pointing in Bali). It would then be expected that the attested patterns are shared with speakers of Balinese in other parts of Bali, too. A study into the different forms of gestural communication, including Kata Kolok and the co-speech gestures of Balinese non-signers, would be required to assess this possibility. While certain pointing forms may occur in both Kata Kolok and co-speech gesture, it is ultimately the functional distribution of these forms and the types of meanings that they convey which determine their linguistic status (see Zeshan 2003b for a similar argument regarding the gestural origins and linguistic status of classifier constructions in Indo-Pakistani Sign Language). Section 15.6 lists a number of the relevant dimensions in comparing pointing gestures and pointing signs on equal grounds to come to a deeper understanding of the differences between them. A second reason as to why the attested patterns may not be fully conventionalised lies in the selected research methodology. The corpus analysis combined data from 10 deaf Kata Kolok signers who are primarily from the fourth biological generation of signers, and this study has not looked into inter-generational or inter-signer variability as such. A portion of the formal regularities that have been described might thus not be conventional in the sense that they are shared by the whole signing community. If Kata Kolok's pointing system has become conventionalised over time, however, we would expect the observed regularities to be more systematic in later generations of Kata Kolok signers.

### *15.3 The incremental construction of meaning in Kata Kolok pointing signs*

The data analysis presented in chapter 14 indicates that the meanings of pointing signs are formed by the unification of various types of information: geography, the signed discourse, facial expressions, and the formal properties of the pointing sign

itself. Moreover, due to the nature of these cues, they appear at different stages of the utterance. This incremental model of pointing is illustrated by Figure 15.1, in which the arrows represent the timing of contributing cues. For example, there is a discourse context leading up to, and succeeding the actual pointing sign. Directly preceding or following a pointing sign, there may be lexical signs that inform its meaning. The pointing sign itself is necessarily marked by its sign-spatial properties indicating a location, which is often extra-linguistic in Kata Kolok. Moreover, a pointing sign takes formal characteristics such as the type of articulator and its movement. As becomes clear from the Kata Kolok data in particular, the non-manual marking of pointing signs can be crucial to their full interpretation.



**Figure 15.1** Incremental cues to the meaning of a pointing sign

Notably, while all pointing signs occur within a discourse context or in a sequential slot, these cues may be of variable importance. Strikingly, a subset of pointing signs has become fully lexicalised; these pointing signs have stable, conventional meanings even when produced outside a relevant discourse context (section 14.5). For other pointing signs, the discourse context is crucial to their meanings (section 14.4.2). The fact that pointing signs are disambiguated based on different types of cues, and at different levels of structural organisation, could lead to differences in the timing at which the meanings of these types of pointing signs become clear. Compare, for instance, examples 4.12 and 14.16, here repeated as Example 15.1 and 15.2, respectively. The correct interpretation *B:i* cannot be predicted on the

basis of preceding signs in the same utterance, but is nevertheless instantaneously interpreted as a reference to first person because it is a B-hand touching the signer's chest and has a distinctive form as such. Conversely, the correct interpretation of *IX* 'at M's trousers' as a colour indication arises from the preceding 'searching behaviour' by the signer.

#### Example 15.1 Non-manual completive aspect II

NM 'pah'

MG GIVE **B:i** RED~THREE

ND

'I had given (them) three hundred thousand rupiah.'

Gta60ct7\_GIVEcompletiveaspect.mpg

#### Example 15.2 Pointing as colour description

NM

MG GHOST HAIR SAME

ND [searching behaviour]

'The ghost had hair like...

NM

MG **IX**'at M's trousers' BODY-COVERED#intens SAME + + + #intens

ND

... M's trousers (black in colour), all over his body.'

Gta60ct7\_pointinforcolour.mpg

A comparison of Examples 15.1 and 15.2 indicates that pointing signs may have different "unique points of identification" depending on whether they are lexicalised or disambiguated largely by the lexical items that precede them. This view of pointing signs opens the possibility that the meanings of less



conventionalised pointing signs are constructed in fundamentally different ways (based on the preceding context of a sign, rather than primarily on its formal properties). Ironically, the meanings of pointing signs that are less distinctive formally might be interpreted sooner than lexical pointing signs, due to the build-up of cues preceding them.

#### *15.4 The grammatical status of Kata Kolok pointing signs*

The literature on pointing signs has been concerned mainly with their grammatical status, and section 7.2 summarised the central issues surrounding this question. Section 15.3 has summarised the various cues that lead to the interpretations of individual Kata Kolok pointing signs, but what can be said in favour of the grammatical status of Kata Kolok pointing signs? In addressing this question, this section follows the arguments regarding American Sign Language presented by Emmorey (1999). First off, Kata Kolok formally marks grammatical categories in its pointing system. For example, the distinction between first-person and non-first person is marked. Moreover, locative points are marked for distance; which is a frequent distinction made in spatial deixis across languages. Kata Kolok pointing signs thus form grammatical paradigms which can also be found in spoken languages.

A second argument that supports the grammatical status of Kata Kolok pointing is the fact that pointing signs, just like other signs, are marked with grammatical non-manual markers. Granting this, there are some classic distinctions that are not systematically marked in Kata Kolok. For instance, similar to other sign languages, Kata Kolok lacks a formal distinction between location indications and non-first person indications (see e.g. Ahlgren (1990) on Swedish Sign Language; Engberg-Pedersen (1993:119) on Danish Sign Language), and both functions are subsumed under the label of demonstrative pronoun. It is unclear whether the distinction between second and third person is systematically marked in Kata Kolok, but the

anaphoric use of list buoys in conjugation with transitive predicates favours such an interpretation.

Grammaticality can also be contrasted with the notion of ungrammaticality based on the intuition that the instantiation of a particular form violates the conventions of use specific to that language. Such a violation could happen when an incorrect form occurs in an otherwise valid slot, or conversely, when a valid form occurs in an incorrect constructional slot. Consider the use of the extensive searching behaviour, which was identified as a strong constructional cue for colour indication. Now imagine this searching behaviour followed by a pointing sign that traces along the east-west axis in the sky. This kind of combination would at the very least be hard to process. Another example comes from the general intensifier: while non-lexical colour indications cannot co-occur with it, locative pointing signs and many other signs can. In other words, there are indications that the Kata Kolok pointing system has grammatical rules of usage, and that these can be violated. This criterion for grammaticality has to do with the degree to which the formal marking of pointing signs might be compulsory. The Kata Kolok signers who I have interviewed do often have meta-linguistic awareness and clear intuitions about, for instance, paradigms of numeral incorporation, or whether a sign originated from Indonesian Sign Language, or whether I was using an appropriate facial expression. In other cases, such as varying constituent orders, and the formal characteristics of pointing signs, Kata Kolok signers did not make strong grammaticality judgements. This observation suggests that while Kata Kolok signers may systematically deploy the form-meaning mappings in pointing signs, these rules of usage constitute implicit knowledge.

Another aspect of grammaticality to consider is the fact that the form-meaning mappings described above are specific to this signing community. The comparison with other sign languages, and the dominance of absolute pointing in particular, shows that this is indeed the case in Kata Kolok. The Kata Kolok pointing system

shows overlap with Balinese pointing gestures too: Balinese speakers also prefer absolute pointing, and they also adopt the celestial timeline. This study has not systematically compared the use of pointing signs in Kata Kolok to pointing gestures in Balinese conversations. Notwithstanding this shortcoming, casual observation suggests that these types of pointing systems differ in their degrees of formal and functional diversification. The Kata Kolok pointing system appears to be more complex in this regard, given the widespread use of grammatical non-manual markers with pointing signs, as well as the use of pointing signs for specific functions such as colour indication.

As certain aspects of Kata Kolok pointing signs are specific to this particular signing community, at least parts of the pointing system need to be learnt by children acquiring the language. The difference in the sign-spatial use of pointing signs (being absolutely rather than relatively motivated) in particular presents a unique opportunity to tease apart the effects of modality and sign language typology in first language acquisition. Moreover, it is not unreasonable to suggest that some aspects of pointing signs, or the combination of certain features, may be harder to acquire than others. One of the future areas of research on Kata Kolok will address this question by analysing the child signing data of two preschoolers between the ages of two and four years (see p. 71 for details about these data). This study will be of particular relevance to questions concerning the grammatical aspects of the Kata Kolok pointing system because it could show how deaf children who are already using infant pointing with their caregivers start to use more complex forms, ultimately re-analysing pointing as part of the grammatical structure of their signed utterances. The study of the native acquisition of American Sign Language has led to independent evidence of the transition from pre-linguistic pointing gestures into pointing signs that are part of this language's pronominal paradigm (Petitto 1987). This reanalysis is abrupt, and parallels the

acquisition of American English pronouns in terms of age of acquisition and substitution errors.

### *15.5 The grammaticalisation of Kata Kolok pointing signs*

The sign language literature on grammaticalisation is primarily concerned with the question of how manual and non-manual gestures are conventionalised to express grammatical meanings (Janzen 1999; McClave 2001; Janzen & Schaffer 2002; Zeshan 2003; Wilcox 2004; Pfau & Steinbach 2006; Janzen 2012). An important observation across these studies is that grammaticalised gestures need not, and often do not, have a morphemic status in these sign languages. The sections below argue that morphemisation and syntactic integration have liberated Kata Kolok pointing signs from context-dependency to varying degrees. In contrast to previous publications on the grammaticalisation of gestures, however, I highlight that these dimensions are distinct from lexicalisation and grammaticalisation in spoken languages.

#### **15.5.1 Morphemisation**

The term lexicalisation encompasses a variety of phenomena, but in the case of spoken languages, the input and output of this process is at least a single morpheme (Himmelmann 2004:27). In the case of sign languages, new words may arise from manual gestures, a process which will be referred to here as *morphemisation*. This latter process appears to be unique to sign languages, and sign language users may deploy signs that are morphemic or “lexemic” to varying degrees (Johnston & Schembri 1999 on Australian Sign Language). For current purposes, I adopt two focal criteria to determine the morphemic status of a sign. First, the sign should have a distinct phonological form, that is to say, it has to be recognisable as a token of a type outside a discourse context. Second, the sign’s meaning, however abstract, must be apparent in isolation. The degree of morphemisation could additionally be supported by an assessment of the degree to

which this form-meaning mapping is shared across the community. However, as mentioned in section 15.2, this study has not directly investigated inter-signer consensus.

By definition, the forms of pointing signs are determined by the conceived location of a relatum, and in the case of Kata Kolok, this location often lies in the extralinguistic context. As argued by Liddell (2000), this sign-spatial variability of pointing signs complicates a phonological analysis.<sup>105</sup> The morphemic group of Kata Kolok pointing signs are recognisable as tokens of a type without any signed discourse, because they have stable sign-spatial forms. Specifically, they are anchored to the signer's body. This class includes the pointing signs used to indicate body parts and colours, as well as the pointing signs with grammatical meanings such as list buoys and first person reference. These morphemic pointing signs can attain deferred meanings based on the signed context, for example the pointing sign meaning 'teeth' can also refer to 'white' and 'tuak,' a white local beverage. Similarly, the sign for 'eye' can also be used as the predicate 'see'. A subgroup of morphemic pointing signs retains a grammatical meaning in its form. Similar to a spoken language pronoun 'he,' a list buoy indicates that the referent is a 'third person,' although the exact referent cannot be retrieved. List buoys align with pointing signs that indicate first person, as their sign-spatial forms are not determined by their situational context, and both forms are marked for the grammatical category of person. The meaning of first person pointing signs may shift depending on discourse context, and therefore, the bare form only entails the grammatical information 'first person.'

A subset of Kata Kolok pointing signs appears to be semi-morphemic. That is to say, while their sign-spatial instantiations are variable, they retain a stable form-meaning mapping through other parameters such as handshape, movement, and

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<sup>105</sup> This point was also addressed in section 7.2.

palm orientation. In the case of Kata Kolok, this class is restricted to distal locatives which are formally marked by an upward fingertip orientation, straight movement, and a lifted upper-arm, in particular. Similar to non-morphemic pointing signs, the sign-spatial direction of predicative and locative pointing signs is determined by extra-linguistic factors. The sign-spatial nature of these pointing signs, counter-intuitively, does not often disambiguate their full meanings. Presumably for this reason, Kata Kolok has evolved formal conventions for pointing signs themselves. Predicative and locative pointing signs are formally marked for linguistic categories, and these formal distinctions reflect their morphemisation. In the cases of other sign languages, such form-meaning mappings may include possessive pronominal forms such as the ones described for Australian Sign Language (Johnston & Schembri 1999:139) and Ugandan Sign Language (Lutalo-Kiingi 2008).

Finally, a number of Kata Kolok pointing signs should be considered non-morphemic. This remaining category includes typical demonstrative references, celestial pointing signs, and non-morphemic colour indications, as well as absolute pointing signs that serve as third person references. Section 15.5.2 shows that while these pointing signs do not have a morphemic status, they can attain specific grammatical functions through sequential slots in the utterance.

#### 15.5.2 Syntactic integration

In the sign language literature, the grammatical meanings and systematic form-function mappings of pointing signs have been taken to support the claim that they have grammaticalised from pointing gestures (for a recent overview including data from multiple sign languages, see Pfau (2011); but cf. Liddell (2003) on American Sign Language). Section 15.4 supports the view that the Kata Kolok pointing system on the whole exhibits a high degree of grammaticality: there are system-internal formal oppositions that are language-specific and that mark grammatical categories. While the literature on grammaticalisation in spoken languages holds a

variety of views regarding this diachronic process, it generally involves the transition of a morpheme to a different grammatical class (see Narrog & Heine 2011 for a recent overview). In the case of Kata Kolok pointing signs, there is no convincing evidence that a specific category of morphemic pointing signs has been derived from another class of morphemic pointing signs, following such a diachronic cline. This section focuses instead on the degree of syntactic integration of pointing signs, and proposes two focal criteria for doing so. First, does the pointing sign fill a specific sequential slot within the language, or is it marked by a grammatical non-manual marker? Second, does the manual form retain a grammatical meaning? Notably, the second criterion is of necessity dependent on the sign's morphemic status. An important finding is that all pointing signs, including non-morphemic ones, may fill simultaneous slots and thus attain a specific syntactic function within the context of the utterance.

Three levels of syntactic integration can be distinguished in the Kata Kolok data set. A minimal level of syntactic integration is found in pointing signs whose meaning is dependent entirely on the situational and discourse context. This category includes prototypical demonstrative pointing gestures, but in the case of Kata Kolok, non-redundant celestial pointing signs are also of this type. The full meanings of these pointing signs are resolved based on the signed context, but not by any formal cues. Most pointing gestures that accompany speech are presumably of this type. The intermediate level of syntactic integration includes pointing signs that are cued by specific lexical signs: the pointing signs in extended celestial pointing constructions, non-lexicalised colour indications, and absolute pointing for third person reference. While these pointing signs are not formally marked themselves, they occur in specific sequential slots that cue their full meanings. This class also includes pointing signs that attain a specific grammatical function through their combined use of a grammatical non-manual marker. It is unclear at present to what extent the meanings of pointing gestures may also be informed by

such sequential or simultaneous constructions. The third and maximal level of syntactic integration concerns those pointing signs that retain a grammatical meaning in their form. The pointing signs in this class also features in sequential and simultaneous slots, but their grammatical interpretation does not rely on it. Table 15.1 presents an overview of the morphemisation and syntactic integration of each of the categories of Kata Kolok pointing signs.

MORPHEMISATION	SYNTACTIC INTEGRATION
<b><i>Morphemic</i></b> List-buoys (Section 7.4) First person pronouns (Section 14.3.2) Body part terms (Section 14.5.1) Colour signs (Section 14.5.2)	<b><i>Maximal syntactic integration</i></b> List-buoys (Section 7.4) First person pronouns (Section 14.3.2) Body part terms (Section 14.5.1) Colour signs (Section 14.5.2)
<b><i>Semi-morphemic</i></b> Locatives (Section 14.2.1) Predicative points (Section 14.2.1)	Locatives (Section 14.2.1) Predicative points (Section 14.2.1)
<b><i>Non-morphemic</i></b> Extended celestial pointing construction (Section 14.4.1) Absolute pointing for third person reference (Section 14.3.1) Non-lexicalised colour indications (Section 14.5.3) Demonstrative pointing (Section 12.2) Non-redundant celestial pointing signs (Section 14.4.2)	<b><i>Intermediate syntactic integration</i></b> Extended celestial pointing construction (Section 14.4.1) Absolute pointing for third person reference (Section 14.3.1) Non-lexicalised colour indications (Section 14.5.3)
	<b><i>Minimal syntactic integration</i></b> Demonstrative pointing (Section 12.2) Non-redundant celestial pointing signs (Section 14.4.2)

**Table 15.1** Morphemisation and syntactic integration of Kata Kolok pointing signs



The overview in Table 15.1 reflects a cline of the morphemisation and syntactic integration of pointing signs, but it is important to note that this cline may not reflect a diachronic process of “grammaticalisation”. The co-production of grammatical non-manual markers, for instance, immediately marks out a particular token of a pointing sign as having a specific grammatical function. Similarly, pointing signs that touch the body are categorically interpreted as morphemes. The degree of morphemisation and syntactic integration also appear to be independent to a certain extent, since non-morphemic and semi-morphemic pointing signs can be considered syntactically integrated through the fact that they fill sequential and simultaneous slots. Section 15.6 addresses how identical criteria may be used to chart the similarities and differences between pointing gestures and pointing signs, and the theoretical issues involved in their comparison.

#### *15.6 Comparing pointing gestures and pointing signs*

There are a number of fundamental similarities between pointing gestures and pointing signs. By definition, the sign-spatial form of pointing gestures and pointing signs are determined by the conceived location of a relatum which is either the referent or associated with the referent. Granting this, communities may have a different underlying spatial format for how this is done, as described in section 6.3. Pointing gestures, like pointing signs, require a fair amount of mind-reading as it is in the nature of pointing that their forms underspecify their full meanings (section 12.2). Apart from these global similarities between pointing signs and pointing gestures, a few studies indicate that the conventions of pointing gestures resemble the conventions of pointing systems in sign languages. First of all, pointing gestures have conventions that are specific to particular speech communities (Wilkins 2003; Kendon 2004; Enfield 2009:90). Secondly, these

pointing gesture systems exhibit language-internal oppositions that mark different functional categories.

Finally, there is some preliminary evidence to suggest that pointing gestures may sometimes be used by hearing communities to mark grammatical categories: according to Wilkins (2003), Arrernte speakers can mark nouns by using a certain type of pointing gesture indicating plurality, while the spoken language does not mark plurality on nouns. If this plurality marker retains its grammatical meaning outside the context of a noun, it should be considered fully morphemic. In other words, when applying modality-independent criteria to pointing signs and pointing gestures, as suggested by Okrent (2002), we might arrive at the view that at least some pointing signs and pointing gestures are equally morphemised. However, as Kendon (2008) argues, we could come to a deeper understanding of gestural expressions by studying them within the varying semiotic contexts of their use. Section 15.6 suggests that when the particular instantiations of pointing gestures versus pointing signs are observed within their differential semiotic ecologies, a number of significant differences can be noted.

There are at present no studies that directly compare the characteristics of pointing signs and pointing gestures, but, nonetheless, a few initial observations can be made. First of all, pointing signs are extremely frequent in signed discourse, with estimates ranging from one in four to one in seven signs (Engberg-Pedersen 2003 on Danish Sign Language; Johnston 2010b on Australian Sign Language; section 13.4). Most studies on co-speech gestures are either based on ethnographic transcription or experimental studies, and for this reason it is difficult to compare the frequency of pointing signs and pointing gestures in comparable data sets.<sup>106</sup> Taking this cautionary note into account, it would appear that the frequency of spontaneous pointing gestures in relation to number of words is considerably

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<sup>106</sup> This methodological issue is also raised by Levinson (2003:251).

lower. Secondly, the functions of pointing signs have diversified considerably and a number of functions that have been reported for pointing signs might not exist in spoken discourse, for example the use of pointing for colour (see section 14.5.2), or pointing signs that function as auxiliaries in Sign Language of the Netherlands and Nihon Shiwa (Japanese Sign Language) (Bos 1994; Fischer 1996). There is no *a priori* reason as to why spoken language communities should not have evolved to adopt the gestural modality for such functions. This suggests that although speakers have both modalities available, they do not distribute information over both modalities equally. This observation brings another issue to light: the relative referential weight of pointing signs is similar to other lexical signs in most utterances (but see section 14.3.1), while this is not the case with pointing gestures in spoken utterances. For example, in Dutch conversations, speakers who are addressing a person can add a pointing gesture directed to that person, resulting in emphasis and a sense of accusation (Zwets 2009). In such a spoken Dutch conversation, the pointing gesture cannot usually replace the spoken pronoun, however, while in a signed conversation the pointing sign is obligatory in most cases. One of the arguments in favour of the grammatical analysis of Kata Kolok pointing signs has been their syntactic integration as evidenced by the use of grammatical non-manual markers used throughout the language. Reports on visual syntactic cues are limited in the literature on spoken languages (but see Jouitteau 2004), and it would be of interest to see whether non-manual cues are an important factor in the integration of pointing gestures in composite utterances in spoken languages, too.

The examples above touch upon the potential differences between pointing signs and pointing gestures as they function within the composite utterances of signed and spoken languages. The analysis throughout this part of the thesis has emphasised the value of considering pointing signs *in situ*. In other words, it has been argued that, in order to arrive at a comprehensive scientific understanding of

pointing phenomena, we need to incorporate all of the factors that play a role in the interlocutor's interpretation of a pointing sign or pointing gesture. A way to move forward is by analysing large quantities of spontaneous pointing gestures and pointing signs as they occur in different communities, and by applying identical criteria to them as suggested in section 15.5. In addition, relative frequency, functional diversification, communicative load, and compulsoriness within the composite utterance are important notions to take into account when comparing the functionality of pointing in both kinds of semiotic ecologies. One potential outcome is that pointing gestures and pointing signs are not essentially different, and that their distinctive characteristics are largely engendered by the semiotic contexts that they inhabit.

## ***PART VI CONCLUSION***

## ***16 Cross-linguistic conventionalisation of sign-spatiality***

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### ***16.1 Sign-spatiality in Kata Kolok***

This thesis builds on a tradition of studies that have demonstrated the ways in which the gestural modality affords sign languages with spatial iconicity (see for example Supalla 1978; Poizner, Klima, & Bellugi 1987; Engberg-Pedersen 1993; Emmorey & Reilly 1995; Taub 2001; Liddell 2003; Perniss 2007). Signers imbue the articulatory signing space that surrounds them with various types of spatial and non-spatial meanings. The Leitmotif throughout the thesis has been that, since signs are essentially spatial forms themselves, any physical aspect of their spatial manifestation could be taken as being relevant to the signed utterance, and chapter 9 of the thesis coined the term sign-spatial significance to identify this domain of interest. Where my analysis departs from previous work is in its emphasis on the unique characteristics of these sign-spatial mappings in Kata Kolok, rather than the iconic or universal aspects of this semiotic strategy (cf. Taub 2001; Liddell 2003; Aronoff et al. 2005). Additionally, this thesis has identified sign-spatiality as a specific type of sign-spatial mapping in which signers systematically recruit the degrees of spatial freedom of signs, by locating, orientating, and directing them to indicate meanings that are ultimately resolved at the interface of grammar and discourse. The analyses gathered in this thesis support the general finding that, on a par with the typological variation between spoken languages in the spatial domain, sign languages deploy sign-spatial mappings in different yet typologically constrained ways.

Chapters 4, 7, and 8 corroborated observations that, in contrast to many previously described sign languages, there are few sign-spatial structures that express non-spatial notions in Kata Kolok (Zeshan 2006a; Zeshan, Marsaja, & de Vos in prep.). The absence of any type of body-anchored timeline and the lack of spatial verb inflection are particularly striking. Chapter 14 confirmed that, with

rare exceptions, the sign-spatial directions of Kata Kolok pointing signs are motivated by geographic locations, rather than loci in the neutral signing space. Chapters 6 and 7 revealed that the sign-spatial properties of indexical signs refer to elements of the situational context or the discourse context depending on the area of the signing space in which they are produced. The sign-spatial characteristics of such forms are resolved anaphorically when they are produced in the neutral signing space, while sign-spatial elements produced outside of this neutral zone are interpreted deictically, in terms of geographic locations.

Simultaneous classifier constructions, in American Sign Language, have been argued to display a high degree of isomorphism with respect to the spatial arrays that they describe (Emmorey & Herzig 2003). The present thesis has shown that this iconic mapping is not straightforward, and that the semantics of simultaneous classifier constructions as employed in Figure-Ground constructions are based on the conventions of sign-spatiality within particular signing communities. These rules of usage became particularly clear from the instances where simultaneous classifier constructions in Kata Kolok are not isomorphic, and their interpretations differ considerably from simultaneous classifier constructions in other sign languages. Specifically, the structured elicitation games analysed in chapter 11 indicate that, unlike other sign languages, simultaneous classifier constructions are not interpreted from the signer's own viewpoint in Kata Kolok. While the scene-internal facing direction is encoded in the orientation of the entity classifiers representing the scene, the construction on the whole does not entail viewpoint information when it is produced on the lateral axis. When Kata Kolok signers produce simultaneous classifier constructions on the sagittal axis, the signer's viewpoint information is foregrounded, presumably because of its pragmatically marked form. In effect, signers may choose to demote viewpoint information by describing spatial configurations on the lateral axis in the signing space. These observations are particularly intriguing as they reveal that sign languages can

abstract away from true isomorphism in a way that images may not (Özyürek et al. 2010). While Kata Kolok signers are able to demote the orientation-information of spatial configurations, scene-internal, facing information is attested through a range of linguistic and cognitive tasks. The Nijmegen Space Games that have been adopted in this thesis were however not designed to directly target the intrinsic Frame of Reference and for this reason additional testing is required to determine the status of the intrinsic Frame of Reference within Kata Kolok.

### *16.2 Sources of variation in sign-spatiality*

Socio-linguistically, Kata Kolok is a village sign language: the sign language is shared by deaf and hearing villagers in a community that has had a high incidence of deafness for a long period of time. In contrast with previous reports which estimated Kata Kolok to be much older, this thesis as laid out the reasons as to why the language is probably in its fifth generation (section 2.5). The village has developed several socio-cultural adaptations to the presence of deaf villagers including special offices for the deaf community members, and a shared belief in a deaf god. Section 2.6 argued that Kata Kolok has become threatened under the influence of Indonesian signing varieties due to recent socio-economic developments. Chapters 2 and 3 described the current setting, and how it informed the creation of the Kata Kolok corpus.

The conclusions presented within this thesis are limited to the third and fourth biological generations of deaf signers. The ages of their members (between 20 and 65) overlap considerably, a number of these individuals have parents from different generations, and on a social level these generations have become closely intertwined. For these methodological reasons, biological generations were judged to be unsuited as a proximate measure to determine potential inter-generational differences (see section 2.5). As such, this thesis has not investigated the historical development of the language as possibly reflected by differences between Kata



Kolok signers from these respective generations. Kisch (forthcoming) discusses the methodological issues in the delineation of generations of signers with regard to the Al-Sayyed Bedouin community in depth. A similar anthropological approach to determining the generations in Bengkala based on patterns of social interaction falls beyond the scope of the present study.

Recent studies, including the present thesis, have indicated that village sign languages may show remarkable characteristics compared with urban sign languages, particularly in the domain of sign-spatiality. A number of village sign languages have been reported to have a large articulatory signing space in comparison to urban sign languages (Adamorobe Sign Language, Nyst (2007a:214); Enga Sign Language, Kendon (1980a); Kata Kolok, Marsaja (2008:159)). Adamorobe Sign Language is the first reported case in which the use of entity classifiers and an observer perspective has not been attested (Nyst 2007a:204). Kata Kolok, Al-Sayyed Bedouin Sign Language, and Providence Island Sign Language use absolute pointing signs to refer to third person referents (Zeshan 2006a; Washabaugh 1986:36; Sandler et al. forthcoming). Kata Kolok (Zeshan 2006a; Marsaja 2008:162; section 4.8) and Al-Sayyed Bedouin Sign Language (Aronoff et al. 2005) do not have agreement verbs. Kata Kolok, Urúbu-Kaapor Sign Language (Brito 1983), and Enga Sign Language (Kendon 1980b) use celestial pointing signs to indicate the times of day and night. Neither Kata Kolok nor Enga Sign Language (Kendon 1980b) has any body-anchored timelines.

The remarkable characteristics of village sign languages have inspired a number of hypotheses suggesting that the social dynamics particular to deaf villages may have caused these characteristics. Aronoff et al. (2008) suggest that the comparatively limited time depth of Al-Sayyed Bedouin Sign Language might explain why that language has not developed agreement verbs. However, Nicaraguan Sign Language has developed a grammatical use of the signing space within the course of three decades (Senghas et al. 1997). Nicaraguan Sign

Language has emerged under quite different circumstances to Al-Sayyed Bedouin Sign Language. Senghas (2005) points out that one of the differences between the two settings is the expansion rate of these incipient signing communities. That is, while in Nicaragua the signing community was enriched with 15-20 new signers each school year, far fewer deaf children have been born into the Al-Sayyed Bedouin Sign Language community over time. The hypotheses that the expansion rate and the time depth are responsible for the development of spatial grammar are compatible with the view that children are particularly adept at language acquisition and creation. Note, however, that they also rely on the assumption that sign languages develop teleologically – towards a common form. Such a finding would be at odds with the typological variation among spoken languages, and it is sometimes thought that this difference may be caused by a homogenising effect of the gestural modality on sign languages. The findings in this thesis do not generally support the teleological view as they reveal that a sign language may develop unique conventions in its use of the signing space. Ethnographic descriptions of co-speech gestures have also brought to light marked structural differences between communities, thus raising the question of whether the natural variation among these semiotic systems may have formed the basis for differences among sign languages, too (Zeshan 2003b).

Another distinct feature of the social dynamics of village sign languages is that many of them have emerged in small, isolated, and tight-knit communities. In the description of Providence Island Sign Language, Washabaugh et al. (1978) noted that signers share a large amount of background knowledge, and make use of this when constructing discourse. Part III of the thesis showed that Kata Kolok discourse is not just highly context-dependent, but requires a substantial amount of extra-linguistic information to be understood fully. This dominance of exophoric reference may be facilitated by the fact that Kata Kolok is normally used in a context in which signers have a large amount of shared background knowledge and

are surrounded by geographic locations that are familiar to their interlocutors. The differences between village sign languages and urban sign languages might thus be caused by the different social contexts in which they are used, rather than a typological difference.<sup>107</sup> This hypothesis predicts that urban signers may use exophoric references more often when they sign in familiar environments with interlocutors that they know very well, and there is at least anecdotal evidence that this may be the case. Conversely, when a village sign language is used in a contextually poor environment, the use of endophoric functions of the signing space may increase. During the course of this project (see section 3.4.4), such contextually-poor data were elicited using stimulus materials that featured individuals unknown to signers. Interestingly, in these data sets, which have not yet been analysed in full, Kata Kolok signers frequently used list buoys to describe the events in the videos, while this mechanism is much rarer in spontaneous discourse. Furthermore, list buoys were subsequently used in conjugation with agreement verbs. These preliminary observations indicate that the context-dependency hypothesis is possibly correct, and deserves further investigation. In assessing this hypothesis, we need to make sure that we compare optimally similar text types from similar social settings in both urban and village sign languages.

As suggested by Zeshan (2003b), it could be that the co-speech gestures of the surrounding hearing communities display similar characteristics and that they have played a dominant role in the initial, formative stages of these village sign languages. In the case of Kata Kolok, it has been argued that the absolute co-speech gestures of the hearing villagers have had an influence on the language (Marsaja 2008:214-31). Similarly, American Sign Language seems to have adopted sign-spatial strategies from the co-speech gestures of their wider hearing

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<sup>107</sup> The idea that language structure is partly determined by social factors is not new and Lupyan & Dale (2010) present a updated overview regarding this issue in spoken languages.

communities, as has been argued for role shift (Poulin & Miller 1998; McClave 2001), and in American Sign Language, Catalan Sign Language, French Sign Language, and Italian Sign Language for agreement verbs (Wilcox 2004). Such an effect could explain why Nicaraguan Sign Language has developed many sign-spatial structures in very little time: the co-speech gestures of the surrounding hearing community might have provided the seeds for these mechanisms.

Crucially, as Nonaka, Nyst & Kisch (2010) point out, the social dimensions that are believed to underlie the differences between urban sign languages and village sign languages are often confounded and for this reason it is difficult to determine which factor(s) contribute(s) to the structural differences, if at all. Moreover, the hypotheses listed above presume that, on a social level, village sign languages are a uniform group (Nonaka et al. 2010). At this moment, however, very little is known about the social habitats of individual village sign languages. Initial reports suggest that they can vary considerably in the number of deaf signers, the number of hearing signers, the expansion rate, the social cohesion of the signing community, the degree of cultural adaptation to deafness, the amount of contact with urban sign languages, generational time depth, etc.<sup>108</sup> Another indication that these hypotheses may be premature is that they assume that village sign languages form a homogeneous linguistic type - which does not seem to be the case (Zeshan 2010). Very few village sign languages have been the subject of extensive linguistic research, and those that have been studied in detail are notably different from one another. Table 16.1 exemplifies this by comparing two village sign languages that have been studied extensively with regard to their sign-spatial structures: Adamorobe Sign Language and Kata Kolok.

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<sup>108</sup> A forthcoming volume addresses anthropological and linguistic variation among a substantial number of village sign languages (Zeshan & de Vos forthcoming).

SIGN-SPATIAL STRUCTURE	KATA KOLOK	ADAMOROB SIGN LANGUAGE
Entity classifiers	<b>+</b> (Section 4.5.1)	<b>-</b> (Nyst 2007a:196)
Agreement verbs	<b>-</b> (Section 4.8.2)	<b>+</b> (Nyst 2007a:158)
List buoys	<b>+</b> (Section 7.4)	<b>-</b> (Frishberg 1975)
Extensive use of simultaneity	<b>+</b> (Chapter 11)	<b>-</b> (Nyst 2007a:206)
Body-anchored timelines	<b>-</b>	<b>+</b> (Nyst 2007a:110)
Absolute celestial timeline	<b>+</b> (Section 8.3)	<b>-</b>

**Table 16.1** Differences in sign-spatial structures between Kata Kolok and Adamorobe Sign Language

This table reveals that a number of sign-spatial characteristics of these two village sign languages are in complementary distribution. While Adamorobe Sign Language does not have entity classifiers, or list buoys, Kata Kolok shows evidence of both of these structures. Conversely, while Kata Kolok has no agreement verbs, Adamorobe Sign Language has a number of them. Furthermore, Adamorobe Sign Language makes limited use of simultaneous structures, while there is ample evidence for this in Kata Kolok, especially with regard to simultaneous classifier constructions. Finally, Kata Kolok has no body-anchored timeline, but only an absolute celestial timeline that functions to indicate the times of day and night. By contrast, Adamorobe Sign Language has a so-called ‘growth

line' that indicates an entity's life span as it ascends in the signing space. Nyst (2007a:110) also reports on a celestial timeline in Adamorobe Sign Language, but this timeline appears essentially body-anchored in the sense that it does not seem to be governed by the geographic location of the sun, but rather relies on the signer canonically facing the east.

The differences between Kata Kolok and Adamorobe Sign Language suggest that differences among village sign languages themselves may be just as large and significant as between village sign languages and urban sign languages. Zeshan et al. (in preparation), for instance, show that Alipur Village Sign Language, Chican Village Sign Language,<sup>109</sup> and Mardin Sign Language have typologically distinct and rare number systems, including a subtractive and a vigesimal system. These number systems are not identical to the respective spoken languages of the larger hearing communities, nor to one another. Another domain of cross-linguistic interest is the use of non-manual markers for grammatical functions. Both Mardin Sign Language and Kata Kolok have a number of non-manual markers that have not previously been attested in any other sign language (Dikyuva p.c.). A further investigation of how these non-manual signals function within these languages would be particularly intriguing in relation to various sentence types, especially since, here too, many sign languages have been assumed to function in uniform ways (see e.g. Sandler & Lillo-Martin 2006). Being language isolates, village sign language represent independent samples in cross-linguistic comparisons, and for this reason, they contribute considerably to the field of sign language typology and to our understanding of the diversity among human languages independent of language modality.

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109 Chican Village Sign Language is a variety of Yucatec-Mayan Sign Language used in the village of Chican.

In recent years, accumulating evidence has revealed differences in sign-spatiality across sign languages. For example, sign languages vary in the number of agreement verbs that are spatially inflected (Nyst 2007a:158; Hong 2009; Schuit et al. 2011). Further, the plural pronouns in American Sign Language and British Sign Language rely on sign-spatiality to different degrees (Cormier 2007). Moreover, pointing signs have grammaticalised into agreement-auxiliaries in some, but not all sign languages (Bos 1994; Fischer 1996; Pfau 2011). In contrast to all previously described sign languages, Urúbu-Kaapor Sign Language has a body-anchored timeline that projects the future towards the signer's front, but which does not stretch into the signing space behind the shoulders (Brito 1983). Finally, signers of Turkish Sign Language also produce simultaneous classifier constructions in an intrinsic manner, that is to say, they need not commit to their own viewpoint as being relevant (Arik 2008; 2009). In contrast to Kata Kolok, however, these forms are produced on the sagittal axis (Arik 2008; 2009). These studies contribute to our overall understanding of the cross-linguistic conventionalisation of sign-spatiality, and the divergences between Adamorobe Sign Language and Kata Kolok in particular make clear that there is no single developmental trajectory across sign languages in the sign-spatial domain. It could still be the case that sign languages accrue more sign-spatial structures over time in a general way, but the comparison between Nicaraguan Sign Language, which developed these structures rapidly, and Kata Kolok, which has not developed these over the past five generations, indicate that additional factors need to be included to explain these differences. A complicating factor is the reliability of our sources to determine the time depth of individual sign languages (see section 2.5).

The findings from Kata Kolok and other village sign languages have directed renewed attention to sign-spatial structures in sign languages. While these structures are unique to the gestural modality, this thesis has emphasised that there is cross-linguistic variation in the extent to which a particular sign language

deploys sign-spatiality. In Kata Kolok, the use of sign-spatiality appears to be limited in comparison to urban sign languages in the domain of time and person reference, in particular. Moreover, the ways in which sign-spatiality is mapped onto various semantic domains indicates that sign-spatiality is conventionalised in language-specific ways. The direction of pointing signs can be motivated absolutely or relatively, for instance (section 6.3). Similarly, simultaneous classifier constructions can in principle be interpreted in terms of a relative, an absolute, or an intrinsic Frame of Reference (section 9.5). The various types of timelines that are reported across sign languages also support the finding that sign-spatiality is mapped onto non-spatial meanings in radically different ways (sections 1.4.3 and 8.3). As is to be expected from typological variation, certain patterns are more common than others. The body-anchored timeline that projects the future onto a signer's front signing space is more prevalent than the absolute celestial timeline, for example. To come to a full understanding of how frequent certain sign-spatial mappings are, we may need to re-evaluate the use of sign-spatiality in urban sign languages with regard to spatial and non-spatial functions.

The results regarding simultaneous classifier constructions in particular suggest that the cross-linguistic variability in sign-spatiality may, in part, be governed by the three Frames of Reference shared with spoken languages (Levinson 2003). However, one striking difference between Frames of Reference expressions in signed and spoken languages is that simultaneous classifier constructions may encode multiple Frames of Reference within a single form (Emmorey 1996). In the case of Kata Kolok, these constructions seem to express either intrinsic and absolute Frame of Reference information, or intrinsic and relative Frame of Reference information (section 10.3). There are also reasons to believe that the ways in which spoken languages structure spatial semantic domains are insufficient to describe sign languages. Specifically, the hierarchical distinctions proposed by Levinson (2003:66) do not allow us to adequately describe the commonalities



between various sign-spatial structures. Pointing signs are recruited in the domains of space, time, and person reference (chapters 6-8). Similarly, entity classifiers are used to describe Figure-Ground configurations, topological relations, and motion events. The domain of cross-modal typology, comparing large sets of spoken and signed languages with the same methodological rigour, is in fact underdeveloped in general (Zeshan et al. in preparation).

The fact that similar sign-spatial constructions are deployed throughout these spatial and non-spatial domains suggests that sign-spatial mappings in one domain may be interrelated with another domain. In Kata Kolok, there is indeed an intriguing overlap in the ways that sign-spatiality is used in simultaneous classifier constructions and in temporal deixis, as in both cases the signer's position in space and consequent viewpoint are irrelevant. In parallel, loci are not set up in the neutral signing space with respect to the signer's own viewpoint. These patterns indicate that sign languages might be classifiable according to the types of sign-spatial mappings they exhibit, and that sign-spatial mappings in the spatial domain could be predictive of mappings in non-spatial domains. In order to assess the viability of this hypothesis we need to take into account all sign-spatial phenomena within a given sign language, focussing on both spatial and non-spatial meanings, and this thesis has been the first concerted effort for doing so in the case of a village sign language.

### *16.3 Future research*

Regardless of what may or may not cause the structural differences between sign languages, the field of sign language research is converging on the fact that sign languages can vary considerably in their use of the signing space (Cormier 2007; Perniss 2007; Arik 2008, 2009; Zeshan, Marsaja, & de Vos in prep.; this thesis). The sections below suggest how this cross-linguistic variation could inform studies into the nature of sign-spatiality. Section 16.3.1 suggests comparative cognitive

experiments regarding the potential influence of a dominant intrinsic Frame of Reference on the spatial skills of Kata Kolok signers. Section 16.3.2 sketches a cross-linguistic study regarding the acquisition of simultaneous classifier constructions. These future avenues of research suggest that cross-linguistic variation in sign-spatiality could prove fruitful in addressing new questions about the nature of spatial iconicity as it relates to human languages and human cognition. Section 16.3.3 suggests an experiment that builds on the main findings from chapter 8 regarding Kata Kolok's unique conception of time. Section 16.3.4 presents a few general remarks on the importance of further grammatical description of Kata Kolok. Finally, section 16.3.5 identifies the scope of the generalisations present in this thesis.

#### 16.3.1 Frames of reference and the nature of spatial iconicity

Chapter 9 identified a number of differences between Frames of Reference in spoken and signed languages. Contrary to Frame of Reference expressions in spoken languages, sign-spatial constructions are based on spatial configurations of signs, and for this reason the relevant Frame of Reference cannot be identified without careful rotational testing. The use of spatial forms means that two Frames of Reference can be expressed simultaneously without contradicting each other. Specifically, while the relative and absolute Frames of Reference are mutually exclusive, either Frame can be combined with the intrinsic Frame of Reference (see also Emmorey 1996; Perniss 2007:165; Arik 2008). The findings in chapter 11 showed that Kata Kolok interlocutors do not perform mental rotations when interpreting each others' simultaneous classifier constructions while sitting face-to-face, but rather prefer absolute translation. It would be interesting to see the extent to which these preferences for rotation and translation are observable in spontaneous interaction between signers.

The differences in spatial representation between Kata Kolok and other sign languages may give us the opportunity to disentangle the effects of language

modality and Frame of Reference in spatial reasoning in a number of ways. Deaf signers using American Sign Language have been reported to have enhanced spatial rotation skills (Emmorey et al. 1998). According to Emmorey et al., this main enhancement of rotational skills is due to the habitual mental rotation of simultaneous classifier constructions in American Sign Language. Conversely, Kata Kolok signers prefer absolute translation rather than mental rotation. If the enhanced rotational skills reported by Emmorey et al. are indeed caused by habitual use of mental rotation in American Sign Language, Kata Kolok signers should not have the same benefits in a spatial rotation task. Conversely, if the results reported by Emmorey et al. constitute a main effect of being a native and primary sign language user, Kata Kolok signers could have spatial rotation skills that are enhanced regardless of the dominance of the absolute Frame of Reference in their language. This alternative hypothesis would predict that Kata Kolok signers perform as well as American Sign Language users in spatial rotation tasks. If both factors - being a native deaf signer, and having a dominant relative Frame of Reference - enhance spatial rotation skills, Kata Kolok signers are predicted to perform worse than American Sign Language users but better than their hearing, Balinese, non-signing community members. Differences in the sign-spatial domain thus enable studies into the nature of the cognitive advantages identified in deaf signers.

In a recent study, Pyers et al. (2010) show that signers from the first cohort of Nicaraguan Sign Language do not systematically distinguish left-right relations and also perform sub-optimally on spatial cognition tasks. In contrast, the individuals from the second cohort of Nicaraguan Sign Language are able to negotiate such relative (left-right) sign-spatiality with their interlocutors, and they perform significantly better in these spatial cognition tasks. Although they are as yet unable to identify the exact mechanism through which this transition takes place, Pyers et al. suggest that this difference is caused by a general effect of

language on spatial cognition. If general language skills, rather than consistent left-right coding indeed facilitate performance on these tasks, Kata Kolok signers are predicted to behave similarly to the second cohort of Nicaraguan Sign Language users. That is, because they are native users of a fully-fledged sign language they should perform equally well. However, if a conventional viewpoint in interpreting simultaneous classifier constructions is a crucial factor in the effects found by Pyers et al., Kata Kolok signers are predicted to perform similarly to the first cohort of Nicaraguan Sign Language users. This comparison could test the idea that the spatial iconicity in sign-spatial constructions is mediated through language-specific conventions.

#### 16.3.2 The comparative acquisition of sign-spatial structures

The past decade has resulted in numerous studies of sign language development by deaf children acquiring urban sign languages (see for example the papers in Chamberlain, Morford, & Mayberry 2000; Morgan & Woll 2002; Schick, Marschark, & Spencer 2006). Deaf children growing up in deaf villages have a comparatively rich linguistic environment, and there are at present no existing studies of first language acquisition in such a uniquely rich signing environment (see p. 71). Moreover, as most urban sign languages had previously been assumed to be of one homogeneous type, the finding that Kata Kolok differs regarding sign-spatial structures could inform comparative developmental studies. In other words, these typologically-informed studies would contribute to our understanding of the nature of sign language acquisition, and language acquisition in general.

One domain of interest is the production and perception of simultaneous classifier constructions by deaf children using Kata Kolok. The intricacies of classifier constructions are not acquired until late childhood (Slobin et al. 2003). Hearing children do not fully grasp relative uses of left and right until the age of 11 (Piaget 1928 cited by Levinson 2003). Similarly, studies of deaf children acquiring American Sign Language and British Sign Language reveal that children do not

systematically apply left-right relations until the age of 12 (Martin & Sera 2006; Herman, Holmes, & Woll 1999 cited by Morgan et al. 2008). Given that Frames of Reference in sign language are based in sign-spatiality, the acquisition of these Frames of Reference may differ radically from the acquisition of spoken language Frames of Reference. Assuming that Kata Kolok, American Sign Language, and British Sign Language do not differ in their use of the intrinsic Frame of Reference, there should be similar patterns and timelines in the acquisition of simultaneous classifier constructions in this respect, and the acquisition of the intrinsic Frame of Reference should precede that of the relative Frame of Reference. In their production and comprehension, both groups of children would diverge in their preference for mental rotation or absolute translation. It might be that children acquiring these three sign languages have a single preferred strategy irrespective of the sign language they are acquiring. For example, one might expect that children in all three groups start by using absolute translation and that, by late childhood, American and British deaf children acquire the adult pattern specific to American Sign Language and British Sign Language: mental rotation. Alternatively, deaf children, whether they acquire Kata Kolok, American Sign Language, or British Sign Language, could start by interpreting the sign-spatial relation between classifiers randomly, before developing a clear preference for either mental rotation or absolute translation. Such a finding would support the interpretation that linguistic conventions are essential to the way deaf children learn to conceive of sign-spatial structures. The production of simultaneous classifier constructions in Kata Kolok is of particular interest, too, as it requires a degree of abstraction to learn that certain visually-available, spatial information can be disregarded in describing them. The differential developmental stages between deaf children acquiring these sign languages could thus be revealing of the linguistic aspects of acquiring Frames of Reference in the gestural modality. The Kata Kolok corpus is in fact the first to include longitudinal child-signing data of

deaf children who grow up in a deaf village, thus enabling numerous studies into the comparative acquisition of typologically-distinct sign languages.

A recent study by Haun et al. (2011) reveals that by the age of eight, hearing Namibian and Dutch children already show robust preferences for geocentric and egocentric responses, respectively, in spatial cognition tasks. By this age, most children will not have full control over the relative Frame of Reference, and Haun et al.'s results might thus indicate that children acquire cultural, spatial knowledge before they achieve full linguistic knowledge of the relative Frame of Reference. Typologically-informed studies into the acquisition of Frames of Reference in both language modalities, as well as their relation to culturally-entrenched practices of spatial conceptualisation, pertain to the linguistic status of the Frames of Reference in Kata Kolok and other signed languages. Such studies would also shed light on the plasticity of human spatial cognition and the roles that culture, language, and modality play in shaping it.

### 16.3.3 Non-linear conception of time

Chapter 8 argued that Kata Kolok's primary distinction in the temporal domain is between present and non-present, and that, although Kata Kolok deploys an absolute celestial timeline to indicate the times of day and night, temporal adverbs are not marked for future or past reference, with rare exceptions. Overall, the system has a very limited use as a spatial metaphor for time, if at all, and this system resembles that of Warlpiri Sign Language as well (Kendon 1993). These findings are particularly striking in light of the cross-linguistically prevalent spatial metaphors that people use to talk about time, which are predominantly determined by the 'future is in front of us' metaphor (but see Nuñez & Sweetser 2006; Boroditsky & Gaby 2010). These linear time metaphors are also reflected in the co-speech gestures of these respective communities.

In general, there is an asymmetrical relationship between spatial and temporal conceptions as reflected by the abundance of spatial metaphors for time, while the

reverse – temporal metaphors or spatial relations - is less frequent. Further, cognitive experiments have shown that people are unable to ignore irrelevant spatial information when they make judgements about duration, but not the reverse (Casasanto & Boroditsky 2008). Casasanto and Boroditsky (2008) pitch their findings to be caused by basic mental representations of distance and duration – a common source which also underlies the asymmetry in metaphoric talk about time and space. If this is the case, Kata Kolok signers and Warlpiri speakers/signers should perform similarly on the various duration judgement tasks that were conducted in Casasanto and Boroditsky's study. Conversely, if having linear metaphors for time is a key factor in the judgements that people make about duration, Kata Kolok signers and the Warlpiri would be less influenced by spatial information in time estimations than other people. Such a finding would indicate that the effects found by Casasanto and Boroditsky could be partly Whorfian, exemplifying an effect of language on thought.

#### 16.3.4 Grammatical description of Kata Kolok

Description of the grammar of Kata Kolok did not begin to take place until recent years, and section 2.7 provided a summary of previous linguistic analyses of the language. I here summarise the main contributions that this thesis has made in terms of the linguistic description of Kata Kolok. Section 4.2.1 adopted Marsaja's (2008) handshape inventory with only few adaptations: the distinction between the loose fist and the tight fist could not be confirmed, and both handshapes are included in the S-hand category. Two additional basic handshapes were identified: the loose 5 hand and the thumb-IX-pinky hand. Finally, it was found that the bunched hand is not used restrictively and should therefore be considered a regular handshape.

Multiple studies reported that a number of Kata Kolok lexical signs have general meanings compared to other (sign) languages (Marsaja 2008:202; Perniss & Zeshan 2008:128; Schwager & Zeshan 2008:526f). In response to these

observations, this thesis has presented the first systematic comparison of the lexica of a village sign language and the spoken language of its wider hearing community in specific semantic domains. Divergence in the lexical sets for colour and kinship in Kata Kolok and Balinese indicates that spoken Balinese and Balinese culture have played a limited role in the emergence of Kata Kolok's lexicon (section 4.3). Section 4.9 has also shown that Kata Kolok and Balinese differ considerably in their main constituent orders.

Kata Kolok exhibits a high degree of indeterminacy in its grammatical constructions, often allowing for multiple viable interpretations (Perniss & Zeshan 2008). Moreover, Schwager and Zeshan (2008) argued that Kata Kolok is an "isolating" language that distinguishes very few word classes at the morphological level. This thesis has suggested that Kata Kolok may differentiate word classes by the co-production of grammatical facial expressions (see sections 4.6 and 14.2).

The grammatical sketch provided in chapter 4 served exclusively to introduce the descriptions in subsequent thesis parts and is therefore far from complete. As is to be expected from a language isolate, the initial studies of Kata Kolok have brought to light many remarkable features, and this suggests that further grammatical analysis of the language could be worthwhile. Most notably, this thesis has not presented a thorough phonological analysis of Kata Kolok, and section 4.2 suggested that the language may deploy a number of non-phonemic handshapes. This thesis also lacks a comprehensive overview of the types of facial expressions that Kata Kolok uses – this is a formal domain which is essential to understanding the grammatical structures of signed utterances. At present, no single comprehensive reference grammar of a signed language exists, and there are multiple challenges in developing such resources. The field of sign linguistics has not yet converged on the central categories that should be included in sign



language grammars.<sup>110</sup> Furthermore, due to the simultaneous nature of many sign language structures, linguists face the task of representing densely packed information in an appropriate format. An ethical consideration in this story is the fact that, in the case of Kata Kolok, many signers are semi-literate or illiterate, and written publications would therefore fail to reach a major portion of the stakeholders involved. Ideally, a reference grammar of a particular sign language should target sign language users, while preserving the linguistic structure of the language in an appropriate format for future generations.

#### 16.3.5 The scope of generalisations

By the start of this research project, Zeshan (2006a) had already noted a number of ways in which Kata Kolok differs from previously documented sign languages in its use of the signing space in particular. Kata Kolok had been reported to lack any metaphorical uses of the signing space including the use of a timeline, transitive verbs with directional movements, and the use of the signing space to express logical contrasts. Chapters 4, 7, and 8 have substantiated these claims by the analysis of spontaneous Kata Kolok discourse. In doing so, this thesis identified a number of sign-spatial structures for maintaining discourse coherence in Kata Kolok that had not been reported prior to this research: body-anchored verbs (section 4.8.3), list buoys (section 7.4), and shifted pronominal pointing signs (section 7.5). Surprisingly, list buoys were also found to be used in conjugation with agreement verbs (see p. 204).

Zeshan (2006a) reported that Kata Kolok uses absolute spatial reference at the level of individual signs, for time reference, with index finger pointing, and more generally in the spatial set-up of discourses (see also Marsaja 2008:159-171). Part V has adopted corpus analysis as a method to chart the complexities of the Kata Kolok's pointing system, and has identified the composite signals that contribute to

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<sup>110</sup> A recently-initiated European project (Cost ACTION) aims to develop such a blue print.

the full meanings of pointing signs in spontaneous discourse: formal characteristics, non-manual marking, neighbouring signs, and the situational and discourse context. As such, this thesis has presented the first comprehensive overview of the ways in which pointing signs are used within a linguistic system.

Marsaja (2008:160) observed that Kata Kolok signers have a significantly larger articulatory signing space than individuals using urban sign languages. Chapter 6 has argued that Kata Kolok signers ascribe different meanings to the neutral and extended areas of the signing space. In particular, sign-spatial forms in the neutral zone of the signing space are resolved anaphorically by the discourse context, while sign-spatial forms produced in the extended signing space are interpreted exophorically, in terms of geographic locations. Part IV continued to explore the sign-spatial inscription of the signing space with regard to Figure-Ground constructions. While it corroborates Zeshan's (2006a) observation that Kata Kolok signers predominantly deploy an absolute Frame of Reference, it has also presented evidence for the use of the relative Frame of Reference, and possibly the intrinsic Frame of Reference in the language. Furthermore, Chapter 11 has presented the results of a set of spatial-cognition tasks which revealed that Kata Kolok signers, unlike users of other absolute languages, do not show a strong preference for an absolute cognitive style.

While I have endeavoured to provide the reader with some insights into the sign-spatial structures of Kata Kolok, a significant number of questions inevitably remain. First of all, this thesis has not examined the relationship between Balinese co-speech gesture and Kata Kolok. Such a comparison would help us to understand how Kata Kolok may have been shaped by the wider semiotic context in which it has emerged and continues to evolve. One potential outcome is that the generalisations presented throughout this thesis may be shared, to some extent, with the Balinese co-speech gesture system. A second domain which has remained unexplored is the demographic factors that potentially underlie linguistic variation

within this shared-signing community. This thesis has not systematically targeted inter-generational differences or the degree of inter-signer variability and it is therefore a logical possibility that certain structures may not be shared across the community. With this shortcoming in mind, the analyses throughout the thesis have included information on the incidence of these phenomena in the annotated corpus whenever available, thus enabling the reader to assess the reliability of descriptions. The creation of the Kata Kolok Corpus allows further verification of these generalisations, based on larger data sets.

In order to optimise comparability with the existing literature on sign languages, documentation and description activities have thusfar centred on the core group of deaf signing adults. It is important to bear in mind, however, that 96% of Kata Kolok signers are hearing, and often, non-fluent sign language users. This latter group of bimodal-bilinguals may simultaneously use forms of spoken and gestural communication, and these hybrid forms may exert an impact on Kata Kolok's structure. Furthermore, Kata Kolok signers have migrated to other parts of Bali and Indonesia in recent years, and the language has since been influenced by the Indonesian signing varieties used in these areas. The linguistic structures that may result from contact between any two typologically-distinct sign languages are, at present, uncharted. The Kata Kolok corpus has included samples from a wide variety of communicative settings and participant configurations including atypical forms of sign language use. Combined with the analyses presented in this thesis, this digital resource enables future studies into the wealth of linguistic diversity that spawns from this extraordinary signing community.

#### *16.4 Concluding remarks*

The research presented in this thesis originated in fundamental questions about the nature of human spatial representations and the way in which linguistic categorisation structures this. It has focused on sign-spatiality - the ways in which

signers recruit the degrees of spatial freedom of signs, by locating, orientating, and directing them to indicate non-morphological meanings that result from the interplay between discourse and grammar. The unique ways in which Kata Kolok signers imbue the signing space with meaning crosscut the spatial and non-spatial functions of this semiotic strategy. This study has adopted Levinson's (2003) spatial typology and has shown that the absolute Frame of Reference is dominant in Kata Kolok discourse. This means that Kata Kolok signers foreground absolute spatial relations between elements of a scene being described, and generally background their own view of the scene. While non-spatial functions of sign-spatiality are limited in Kata Kolok, the existence of the absolute celestial timeline, and the absence of loci in the neutral signing space suggest that here too the signer's viewpoint is irrelevant. This is the first reported case of such a unique spatial construal, and these findings open the "possibility space" of conceivable sign languages considerably.

This thesis has charted the various domains in which sign-spatiality surfaces within a given sign language. The cross-linguistic patterns found thus far make clear that, while sign-spatiality is a modality-specific phenomenon, its implementation may differ from one sign language to the next. The methodologies and theoretical distinctions deployed in this thesis could serve as guidelines to chart sign-spatiality as it is recruited in other types of gestural communication, including both urban and village sign languages, tactile sign languages, home sign, co-speech gesture, and pantomime. It would be of particular interest to see whether these forms of gestural communication are typologically constrained in similar ways, and how Frame of Reference information is distributed over both natural language modalities – spoken and gestural – in hearing interaction. The methodology proposed and adopted in chapter 15, which set out to compare pointing signs and pointing gestures on equal grounds could be applied more broadly. That is to say, we need to assess how gestural communication functions in

varying semiotic ecologies to fully comprehend the affordances of the gestural modality.

In general, the findings in this thesis challenge previous assumptions about the nature of spatial iconicity in the gestural modality. Rather than a position in which sign-spatial mapping has a unifying effect on the structures of sign languages, this study suggests that signers may structure space in radically different but typologically constrained ways. At the same time, spoken language typologies are insufficient to capture the full range of spatial expressions in sign languages. A way of moving forward would be to compare large sets of signed and spoken language data in order to model the intramodal and intermodal variation in both types of languages. Such a cross-modal typology could contribute significantly to our understanding of the factors that shape the linguistic and cognitive diversity in the domain of space independent of language modality.

## Appendix I Consent forms

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**Sign Language Typology Research Group**  
di  
**Max-Planck Institute for Psycholinguistics**  
Postbus 310, 6500 AH Nijmegen, the Netherlands  
dan  
**International Centre for Sign Languages and Deaf Studies, University of Central Lancashire**  
Faculty of Arts, Humanities and Social Sciences, Livesey House LH212, Preston PR1 2HE

Blangko persetujuan

(Silahkan pilih “☐” yang mana diseujui dalam permohonan blangko ini.)

Saya setuju data bahasa saya untuk disimpan dan dianalisis di Max-Planck Institute for Psycholinguistics dan di University of Central Lancashire untuk kepentingan penelitian di kelompok tipe bahasa isyarat.

Tambahan:

☐ Saya tidak setuju data video atau photos di publikasikan karena saya ingin mengingatkan juga nama secara komplit ( ini adalah, hanya terjemahan teks dan gambar garis yang bisa di publikasikan.

**Atau:**

Saya setuju di publikasikan seperti dibawah ini:

1. Photos di dalam publikasi ( copy, CD-Rom etc.) dan atau
2. Bagian dari video untuk konperensi (Presentasi) dan atau
3. Bagian dari video dalam publikasi (CD-Rom dll) dan atau
4. Photo-photo dan Video di Internet

\_\_\_\_\_  
Nama depan dan Nama belakang

\_\_\_\_\_  
Tempat Tanggal Tanda tangan

\_\_\_\_\_  
Untuk anak nya orang tuanya memberi kode nama depan dan nama akhir.

**Sign Language Typology Research Group**  
at the  
**Max-Planck Institute for Psycholinguistics**  
Postbus 310, 6500 AH Nijmegen, the Netherlands  
and the  
**International Centre for Sign Languages and Deaf Studies, University of Central Lancashire**  
Faculty of Arts, Humanities and Social Sciences, Livesey House LH212, Preston PR1 2HE

Consent form

(Please tick “☐“ where applicable to show your consent)

☐ I agree to having my sign language data stored and analyzed at the Max-Planck Institute for Psycholinguistics and at the University of Central Lancashire for the purpose of research in the Sign Language Typology Research Group.

In addition:

☐ I do not consent to the publication of video data or photos because I want to remain completely anonymous. (that is, only transcribed texts and line drawings can be published)

**Or:**

I agree to the publication of the following:

- ☐ 1. Photos in publications (print, CD-Rom etc.) and/or
- ☐ 2. Video segments for conferences (presentations) and/or
- ☐ 3. Video segments in publications (CD-Rom etc.) and/or
- ☐ 4. Photos and Videos in the internet.

\_\_\_\_\_  
First name and last name

\_\_\_\_\_  
Place                      Date                      Signature

\_\_\_\_\_  
In case of parents signing for a child, the child's first and last name

## Appendix II Annotation conventions

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These transcription conventions were adopted from the Sign Language Typology group headed by Ulrike Zeshan from 2003-2006 at the Max Planck Institute for Psycholinguistics in Nijmegen.

### ELAN tiers

Main Gloss	Glosses for the manual signs; gloss both hands on this line if they are parallel to each other; gloss non-dominant hand on separate line if both hands are different (see also 2.1-2.3).
Non-dom. Hand	Gloss for non-dominant hand; use only if non-dominant hand is different from dominant hand.
Non-manual signals	Direction of eyes and/or head. Facial expressions and body movements.
Translation	English translation.
Translation Indonesian	Indonesian translation

### Symbols within the main gloss and non-dominant gloss line

gloss+gloss	compounding	lex.m.+lex.m. (eg. TWO+YEAR)
gloss#gloss	simultaneous morphemes	lex.m.#lex.m. (eg. TWO#WEEK), or lex.m.#gr.m. (eg. WORK#DUR)
gloss^gloss	sequential morphemes	lex.m.^gr.m. (eg. WORK^AGENT) or gr.m.^lex.m. (eg. IX:ear^GOOD)
gloss:x	location of sign	(eg. WORK:I)
gloss:x->y	direction of sign	(eg. SEND-LETTER:i->f)
gloss:‘...’	specification of gloss meaning in lower case	(eg. IX:ear^GOOD:‘hearing’)

### Special names & abbreviations within main & non-dominant gloss lines

IX:x	index finger point
B:x	pointing with B-hand
entity-	whole entity form with specification of handshape(s) for a moving



X:‘...’	entity; after the colon a rewriting of meaning in lower case (eg. entity-B:‘car drives fast rd->lfu’); entity-V:‘person goes i->f’)
handle-	handle form with specification of handshape(s); after the colon
X:‘...’	rewriting of meaning in lower case
DUR	durative aspect
ITER	iterative aspect
DISTR	distributive aspect
EMPH	emphatic marking
INTENS	intensification
DIMIN	diminutive marking
NEG	negation

*Non-manual signals*

hs	Headshake (side-to-side)
ml	Mouth corners lowered
nod	Head nods
pah	Lipsmack
pl	Pursed lips
pt	Protruded tongue
rb	Raised brows
sq	Squinted eyes

### Appendix III Stimulus materials Man and Tree Game

---

2.3



2.4



2.5



2.6



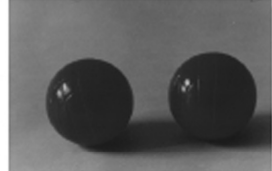
2.7



2.8



2.9



2.10



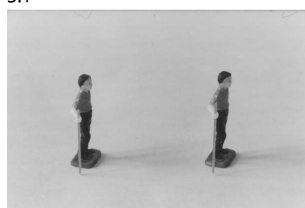
2.11



2.12



3.1



3.2



3.3



3.4



3.5



3.6



3.7



3.8



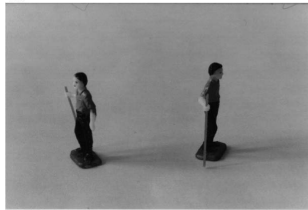
4.5



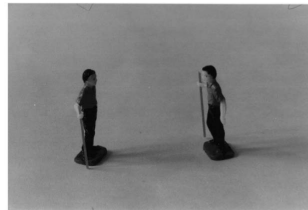
4.6



4.7



4.8



4.9



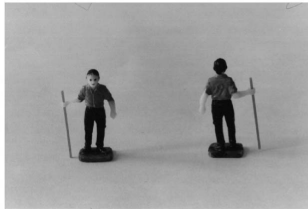
4.10



4.11



4.12



## Appendix IV Pointing coding scheme

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### *Articulator*

B B-hand

IX Index finger

### *Form of index finger*

In the normal case the index finger is straight and this was therefore not coded.

b bent

l lax

### *Arm*

L upper arm is lifted

### *Dominant versus non-dominant hand*

In the normal case the pointing sign is produced with the dominant hand and this was therefore not coded.

n non-dominant hand

### *Palm orientation*

S supinated (upward)

P pronated (downward)

N neutral

### *Fingertip orientation*

n the index finger is in line with the rest of the hand

u index finger tip is pointing upwards

d index finger tip is pointing downwards

### *Movement*

+m the pointing sign has a movement of its own

+mr repeated movement

-m the pointing sign has no movement of its own

### *Path of movement*

s straight movement

a arched movement

u upward

d downward  
zz zigzag  
e east  
w west

*Non-manuals*

Eye gaze

+e eye gaze is in the same direction as the point  
+ea eye gaze is directed towards the addressee  
-e eye gaze is not directed in the direction of the point nor the addressee

**Functions of pointing**

Annotations are made on the Pointing\_function tier.

TIME	pointing for time
LOC	referring to a location
OBJ	referring to an object
1PS	first person singular
2PS	second person singular/addressee
3PS	third person singular
'...'	referent
# M	multiple referents
# DIST	distant location
e	present entity at recording session
d	deferred ostension
f	focal, new information
r	reference
p	predication

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## Samenvatting

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De ruimtelijke aspecten van gebaren - hun positie, orientatie, en beweging - spelen een cruciale rol in de structuur van gebarentalen. Dit proefschrift beschrijft hoe gebaarders de ruimtelijke eigenschappen van hun gebaren manipuleren om betekenissen over te brengen die voortvloeien uit het samenspel tussen context en grammatica. Voor dit specifieke gebruik stelt dit proefschrift de overkoepelende term *sign-spatiality* voor.<sup>111</sup> Waar voorheen veelal aangenomen werd dat gebarentalen in dit domein weinig variatie vertonen, beschrijft dit proefschrift juist de uitzonderlijke kenmerken van een Balinese gebarentaal genaamd Kata Kolok.

**Deel II** van dit proefschrift biedt allereerst een beschrijving van de geschiedenis en ontwikkeling Kata Kolok aan de hand van bestaande literatuur uit de genetica, antropologie, en sociolinguïstiek. Kata Kolok is vijf generaties geleden in een dorp op Bali (Bengkala) ontstaan als gevolg van het feit dat er veel doofheid voorkomt in de gemeenschap. De specifieke vorm van doofheid die in het dorp voorkomt, wordt veroorzaakt door een recessief gen waarvan bijna een vijfde van de horende dorpingen ook drager is. Op dit moment zijn er 46 dove individuen in Bengkala, van alle leeftijden, maar tweederde van de horende dorpingen gebruikt de gebarentaal ook. Elk van de tien clans heeft dove leden en Kata Kolok is in alle aspecten van het dorpsleven vertegenwoordigd: in discussies over lokale politiek, tijdens de voorbereidingen van religieuze ceremonies, in de diverse eenmanszaakjes van het dorp, en tevens is in 2007 een dovenklas opgericht waar Kata Kolok wordt gebruikt als voertaal. Gegeven het feit dat Kata Kolok al door meerdere aaneensluitende generaties van dove mensen wordt gebruikt, en het feit dat de taal

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<sup>111</sup> De term *sign-spatiality* laat zich in het Nederlands nog het beste vertalen als 'gebarenruimtelijkheid', maar in de huidige context laat ik dit woord, als ook ander jargon, onvertaald om de technische betekenissen ervan te waarborgen.



in allerlei sociale situaties een rol speelt, spreken we hier van een volledig ontwikkelde taal net als bijvoorbeeld het Nederlands, of Nederlandse Gebarentaal. Kata Kolok is tevens een 'geïsoleerde gebarentaal', dat wil zeggen dat ze geen verwantschap vertoont met de varianten van Indonesische gebarentaal die in andere delen van Bali en Java worden gebruikt. Ook lijkt het intieme taalcontact tussen Kata Kolok en het gesproken Balinees niet geleid te hebben tot gelijkenissen in de woordenschat of de woordvolgorde.

In de afgelopen jaren zijn steeds meer dove mensen uit Bengkala naar andere delen van Bali en Indonesië geëmigreerd, en daardoor is de jongste generatie van Kata Kolok gebaarders veelal tweetalig in beide gebarentalen. Deze situatie heeft er toe geleid dat het prestige van Kata Kolok is gedaald ten gunste van Indonesische gebarentaal. Bovendien hebben steeds meer horende en dove dorpelingen een voorkeur voor een partner van buiten de gemeenschap. Doordat deze partners het 'dove' gen niet bij zich dragen, neemt de geboorte van dove kinderen af. Beide patronen - het taalcontact met Indonesische gebarentaal en veranderingen in huwelijkspatronen - hebben in soortgelijke gemeenschappen geleid tot het uitsterven van de lokale gebarentaal en dragen daarom bij aan een somber toekomstperspectief voor de taal. Dit promotieonderzoek geeft om die reden niet alleen een beschrijving van Kata Kolok, maar heeft ook getracht de taal in kaart te brengen middels digitaal archief. Dit zogenaamde corpus omvat meer dan 100 uur aan video-opnames en is gedeeltelijk getranscribeerd. Het Kata Kolok corpus biedt een dwarsdoorsnede van haar gebruikersgemeenschap en bevat daardoor als een van de weinige gebarentaalcorpora opnames van horende en niet-vloeiende gebaarders, dove mensen die zowel Kata Kolok als Indonesische gebarentaal gebruiken, en ook opnames van dove kinderen die gedurende hun taalontwikkeling zijn gevolgd. Doordat alle grammaticale beschrijvingen in dit proefschrift zijn gebaseerd op uitingen van dove dorpelingen van de vierde

generatie van Kata Kolok gebaarders, zijn de bevindingen optimaal vergelijkbaar met eerder verschenen beschrijvingen van andere gebarentalen.

**Deel III** introduceert het concept *sign-spatiality* dat refereert aan de observatie dat gebaarders de locatie, oriëntatie, en richting van hun gebaren systematisch manipuleren om betekenissen over te dragen die het morfologische niveau ontstijgen. De semantische aard van deze ruimtelijke constructies is hybride aangezien hun betekenissen voortvloeien uit een synthese van grammaticale en contextuele informatie. In dit opzicht is sign-spatiality niet uitzonderlijk, aangezien de referentiële betekenis van andere taalstructuren zoals bijvoorbeeld deictische elementen (bijv. 'vandaag'), ook op deze manier tot stand komt. Sign-spatiality is uniek voor de visuele taalmodaliteit aangezien het de ruimtelijke vrijheidsgraden van gebaren optimaal benut. Sterker nog, in de gebarentaalliteratuur is tot nu toe weinig diversiteit gerapporteerd in het domein van sign-spatiality, en sommige auteurs hebben gesuggereerd dat de beeldende eigenschappen van de visuele taalmodaliteit verantwoordelijk zijn voor dit gebrek aan variatie. Eerdere beschrijvingen van Kata Kolok lieten al zien dat deze taal niet voldoet aan het gangbare beeld van een gebarentaal: een aantal typische ruimtelijke structuren zoals het ruimtelijke vervoegen van werkwoorden en een tijdslijn waarbij het verleden achter je ligt, bestaan niet in Kata Kolok. In de overgebleven hoofdstukken van deel III wordt het gebruik van sign-spatiality door Kata Kolok gebaarders behandeld in drie referentiële domeinen: locaties, grammaticale verwijzingen naar personen, objecten en concepten, en tijdsrelaties.

Wanneer Kata Kolok gebaarders naar plaatsen verwijzen, corresponderen deze vormen vrijwel altijd met de daadwerkelijke geografische locatie. Ook wanneer zij naar personen verwijzen, dan zijn hun gebaren verankerd in de lokale topografie van het dorp, bijvoorbeeld het huis van die persoon. Dit geldt ook voor meer abstracte concepten zoals bijvoorbeeld 'het buitenland', waarbij het wijsgebaar

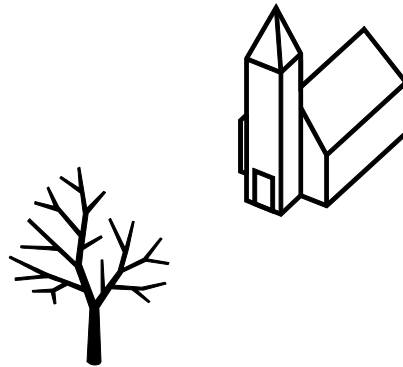
gericht is op een vliegveld dat nu niet meer actief is. Deze types van sign-spatiality worden gekenmerkt door geografische vormen en hun interpretatie berust daardoor grotendeels op gedeelde topografische kennis van gesprekspartners. Kata Kolok gebaarders kunnen wijsgebaren ook richten op de vingertoppen om hun verhaal te construeren, wanneer niet kan worden aangenomen dat hun gesprekspartner bekend is met de referenten, of wanneer meerdere referenten geassocieerd worden met een enkele locatie (zoals bijvoorbeeld familieleden).

Ook in uitingen omtrent tijdsrelaties vindt het geografische systeem weerklank: om kloktijden te duiden refereren Kata Kolok gebaarders aan de positie van de zon gedurende de dag. Het is tevens bijzonder dat, in het temporele domein, de gebarentaal geen werkwoordsvervoegingen gebruikt die duidelijk maken of het een gebeurtenis in de toekomst of het verleden betreft. Ook is er slechts een zeer beperkte set van bijwoorden ('gister', 'eergister', 'drie dagen geleden', en 'vier dagen geleden') die dit onderscheid maken. In plaats hiervan gebruiken gebaarders een vorm van 'ooit' en maken hun gesprekspartners uit de context op of het om een gepasseerde of toekomstige draait.

De bevindingen uit dit deel van het proefschrift suggereren dat deze uitzonderlijke kenmerken wellicht te maken hebben met het feit dat de taal binnen een hechte gemeenschap is ontstaan en daardoor optimaal gebruik maakt van de gedeelde achtergrondkennis van gebaarders. Deze hypothese zou verder kunnen worden onderzocht door te kijken naar verhalen of gesprekken die niet direct aan de lokale context gekoppeld zijn.

In **Deel IV** van het proefschrift komt de rol van sign-spatiality bij zogenaamde *Frames of Reference* aan bod. Frames of Reference zijn grammaticale constructies die de ruimtelijke relatie beschrijven tussen twee objecten waartussen een ongelijkheid in grootte en/of prominentie bestaat. Een dergelijke ruimtelijke

configuratie wordt verbeeld in de tekening hieronder (zie ook Figuur 1.1 op pagina 3 van het proefschrift).



De relatie tussen deze boom en kerk kan op verschillende manieren beschreven worden, bijvoorbeeld als "de boom staat links van de kerk", "de boom staat aan de voorkant van de kerk", of "de boom staat ten Westen van de kerk". In het eerste geval wordt de ruimtelijke relatie beschreven in relatie tot een extern referentiepunt. In het tweede geval wordt dezelfde relatie beschreven aan hand van de intrinsieke eigenschappen van het achtergrondobject - de kerk. In het derde en laatste geval wordt het ruimtelijke verband tussen de boom en de kerk bepaald aan de hand van vaststaande windrichtingen. Deze drie constructietypes worden respectievelijk het relatieve, intrinsieke, en absolute Frame of Reference genoemd. Talen kunnen verschillen in het aantal Frames dat zij gebruiken, en het type frame waaraan zij de voorkeur geven. In het gesproken Balinees is er een sterke voorkeur voor het gebruik van het absolute Frame of Reference, ook wanneer over kleine objecten zoals een vlieg op de westerwang wordt gepraat.

In Kata Kolok worden geen aparte gebaren gebruikt om ruimtelijke relaties te duiden en in plaats daarvan worden ze uitgebeeld middels *Simultaneous Classifier Constructions*: het betekenisvol positioneren van referentiële handvormen in de

gebarenruimte. De ruimtelijke relatie tussen de handen kan, door hun driedimensionale eigenschappen, in het kader van de verschillende Frames of Reference worden geïnterpreteerd. De ruimtelijke relevantie van deze Simultaneous Classifier Constructions, in termen van Frames of Reference, kan alleen worden bepaald op basis van het rotatieparadigma. Het rotatieparadigma houdt in dat één van de elementen uit de ruimtelijke configuratie systematisch wordt aangepast, om zo de voortvloeiende betekenisverschillen tussen de diverse Frames of Reference bloot te leggen. Een uiting van het relatieve type wordt enkel en alleen onjuist wanneer het externe referentiepunt is gewijzigd: als de spreker bijvoorbeeld om de kerk heen is gelopen, klopt de uitspraak 'de boom staat links van de kerk' bijvoorbeeld niet meer. In ditzelfde geval blijven de intrinsieke (aan de voorkant) en de absolute (ten westen van) beschrijving correct. Intrinsieke beschrijvingen veranderen alleen wanneer de oriëntatie van het grotere object is gewijzigd, bijvoorbeeld als men de kerk om zijn as had kunnen roteren. Deze rotatie heeft echter geen gevolgen voor de overige twee Frames. Als de ruimtelijke configuratie, de spreker inclusief, in zijn geheel zou worden geroteerd, wordt dezelfde absolute beschrijving in termen van windrichtingen onwaar, maar de relatieve en intrinsieke beschrijvingen blijven correct.

De hoofdstukken van Deel IV bouwen voort op het rotatieparadigma en laten zien aan de hand van de *Nijmegen Space Games* - een set talige en cognitieve taken - dat er in Kata Kolok tevens een voorkeur bestaat voor het absolute Frame of Reference. In die zin wijkt het gebruik van sign-spatiality in Kata Kolok radicaal af van eerder beschreven gebarentalen, waar het relatieve Frame of Reference domineert. De analyse van spontane verhalen in Kata Kolok laat bovendien zien dat de interpretatie van een Simultaneous Classifier Construction mede bepaald lijkt te zijn door de achtergrondkennis die de gebaarder geacht wordt te hebben. Wanneer een gebaarder bijvoorbeeld verhaalt over een fataal motorongeluk waarover dus geen precieze ruimtelijke informatie beschikbaar is, hoeft de

Simultaneous Classifier Construction niet met de windrichting van deze gebeurtenis te corresponderen. Het is bovendien opvallend dat Kata Kolok gebaarders bij ruimtelijke geheugentaken geen sterke voorkeur hebben voor een 'absolute' cognitieve stijl, in tegenstelling tot sprekers van andere 'absolute' talen. Dit laatste verschil wijst er op dat, naast het dominante Frame of Reference in de moedertaal van een individu, er ook nog andere omgevingsfactoren een rol zouden kunnen spelen bij de keuze voor een ruimtelijke, cognitieve stijl.

In de gebarentaalliteratuur zijn wijsgebaren traditioneel vaak beschreven aan de hand van hun ruimtelijke eigenschappen en **Deel V** van het proefschrift bouwt hierop voort. Uit een analyse van spontane gesprekken tussen Kata Kolok gebaarders blijkt dat één op de zes gebaren een wijsgebaar betreft. Wijsgebaren vormen een heterogene groep binnen de taal en worden gebruikt om te verwijzen naar locaties, individuen, kleuren, lichaamsdelen, en tijdstippen. In totaal werden meer dan 1000 wijsgebaren in detail bekeken om vast te stellen hoe deze verschillende functies gerealiseerd worden. Uit deze corpusanalyse blijkt dat de betekenis van een specifiek wijsgebaar kan worden geconstrueerd aan de hand van diverse signalen. Allereerst zijn omgevingsfactoren van belang: waar bevinden de gebaarder en zijn gesprekspartner zich, en in welke richting wordt gewezen? Ook is het van belang om te weten in hoeverre gesprekspartners bepaalde achtergrondkennis delen, bijvoorbeeld over waar de persoon woont waaraan gerefereerd wordt, of wat de gesprekspartners elkaar eerder in het gesprek verteld hebben. Een enkel woord kan soms al een sterke aanwijzing zijn voor de betekenis van een wijsgebaar. Wijsgebaren die kleuren indiceren, bijvoorbeeld, worden ofwel voorafgegaan door het gebaar VERF, of doordat de gebaarder demonstratief om zich heen kijkt om naar een nabij object met de desbetreffende kleur te kunnen wijzen. In bepaalde gevallen is de betekenis van een wijsgebaar gefossiliseerd; een wijsgebaar dat gemaakt wordt op het gebit van de gebaarder, verwijst altijd naar de

kleur 'wit'. De betekenis van wijsbaren in Kata Kolok wordt soms ook gereflecteerd in hun vorm. Wijsgebaren die naar een verafgelegen locatie verwijzen worden bijvoorbeeld hoog in de gebarenruimte gemaakt met een projecterende beweging vanuit het polsgewricht wanneer de arm volledig gestrekt is. Deze groep van locatieve wijsgebaren gaat vaak ook gepaard met getuile lippen. Deze en andere gezichtsuitdrukkingen bepalen tevens de grammaticale functie van wijsgebaren.

De hierboven genoemde types van signalen (wijsrichting, blikrichting, gezichtsuitdrukking, handvorm etc.) zijn al eerder gerapporteerd in de literatuur over wijzen in gebarentalen, maar tevens in de beschrijving van wijsgebaren bij sprekers. Tegelijkertijd lijken wijsgebaren in deze twee soorten gesprekken te verschillen in hun frequentie van voorkomen tijdens spontane conversaties, de communicatieve lading binnen de zin, hun algehele functionele en formele diversificatie, alsmede de mate waarin ze een verplicht onderdeel uitmaken van een uiting. Alleen een systematische vergelijking van spontane gesprekken in beide taalmodaliteiten zou kunnen leiden tot een beter begrip van de verschillen en overeenkomsten tussen wijsgebaren in deze beide contexten. In meer algemene zin zou een dergelijk onderzoek leiden tot een beter inzicht in de rol van de visuele modaliteit in deze types van conversaties, als ook een mogelijk verband tussen taalmodaliteit en taalstructuur kunnen aantonen.

**Deel VI** vat de belangrijkste bevindingen en beperkingen van dit proefschrift samen en formuleert een aantal overgebleven en nieuw gerezen onderzoeksvragen en methodologische implicaties. De studie van Kata Kolok heeft laten zien dat gebarentalen verschillen kunnen vertonen in het domein van sign-spatiality en heeft zodanig onze kennis van de grammaticale variatie onder gebarentalen verrijkt. Om de daadwerkelijke invloed van de visuele taalmodaliteit op taalstructuur te kunnen bepalen zal toekomstige onderzoek zich moet richten op het

systematisch vergelijken van de situaties waarbinnen taal ontstaat: spontane interacties tussen sprekers en tussen gebaarders. In ieder geval schept de diversiteit die hier is aangetoond vragen over de relatie tussen ruimtelijke cognitie, cultuur en taalmodaliteit, maar zij kan bijvoorbeeld ook de basis vormen voor een systematische vergelijking van de verwerving van zeer afwijkende gebarentalen door dove kinderen.

Hoewel dit proefschrift inzichten biedt in de rol van sign-spatiality binnen diverse betekenisdomeinen in Kata Kolok, is er niet systematisch onderzocht welke mogelijke factoren geleid hebben tot dit uitzonderlijke gebruik van de gebarenruimte. Het zou bijvoorbeeld zo kunnen zijn dat de non-verbale communicatie van Balinezen een rol heeft gespeeld bij het ontstaan van dit systeem, aangezien zij ook absolute gebaren maken tijdens het spreken. Tevens zouden de taalverwervingspatronen van het grote aantal tweede-taalleerders een rol kunnen hebben gespeeld. Een vergelijking van de verschillende generaties van gebaarders had ons meer kunnen vertellen over een mogelijke derde factor: de historische diepte van Kata Kolok als taal. De beschrijvingen in dit proefschrift zijn gebaseerd op een selectieve groep van dove dorpelingen uit de vierde generatie van Kata Kolok gebaarders, en daardoor kunnen deze vragen op dit moment niet worden beantwoord. Het digitale archief dat is aangelegd gedurende dit project kan echter wel in de toekomst gebruikt worden om deze diverse hypotheses te evalueren en zo licht te werpen op het mogelijke verband tussen de eigenschappen van de gebarengemeenschap en de structuur van haar gebarentaal.



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## Curriculum vitae

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Connie de Vos was born in Eindhoven, the Netherlands on August 22, 1983. She received her MA in Linguistics *cum laude* in 2006 from Radboud University with a thesis on facial expressions in Sign Language of the Netherlands. Directly following, she was invited for a PhD student position within the Language & Cognition group at the Max Planck Institute for Psycholinguistics. Over the past 6 years, she has spent more than a year in Bali, documenting and describing Kata Kolok. During these visits to the community, she has collaborated with local authorities to create a digital archive of the language, and she has also initiated the establishment of inclusive deaf education in which Kata Kolok has been used as a language of instruction. Early 2010, Connie de Vos accepted a position as a post-doctoral research assistant for the EuroBABEL project on Endangered Sign Languages in Village Communities at the International Institute for Sign Languages and Deaf Studies (iSLanDS). She was awarded an ELDP Small Grant for the longitudinal documentation of first language acquisition of Kata Kolok mid-2011. Since mid-2012, she has been research staff member within the Interactional Foundations of Language project at the Max Planck Institute for Psycholinguistics.